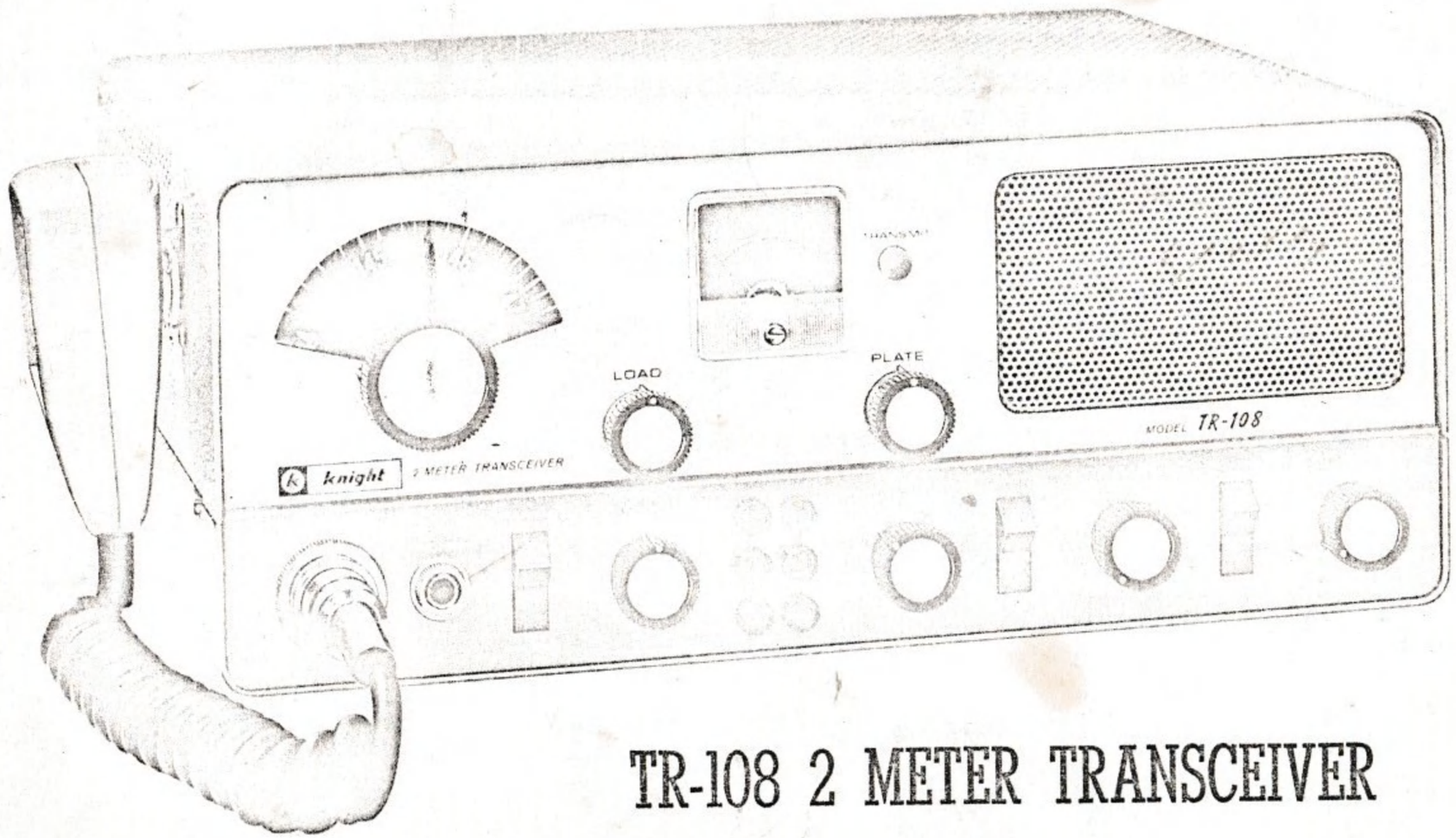
WB4VAP
CLARENCE W. MULLIGAN
150 CORAL CIRCLE
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knight-kit®



TR-108 2 METER TRANSCEIVER

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CONSTRUCTION HINTS

You are preparing to build a high quality, well designed 2 meter transceiver. Since most of the wiring involves Radio Frequency circuits **you must keep all leads as short as possible.** This is a vital point to keep in mind and you must take care to follow it closely.

Follow the instructions carefully and give attention to all the special notes. Above all — TAKE YOUR TIME. Very often a hasty job is a poor one. Take your time and you will have an instrument that will operate as it was designed to operate. You also will feel a greater pride of accomplishment with a neatly wired unit.

UNPACKING

This step is important because it gives you a chance to become familiar with the parts used in your kit.

☐ Carefully unpack all the parts. Be especially careful with the meter and switches.

☐ Check the contents of your kit against the PARTS LIST. Use the wiring illustrations for any parts you do not recognize. The controls and large resistors are too large to mount on the cards, so these spaces have been left vacant.

☐ Assort hardware by size. A plastic ice-cube tray or muffin baking pan is very handy for keeping small parts and hardware separate. It will also prevent misplacement.

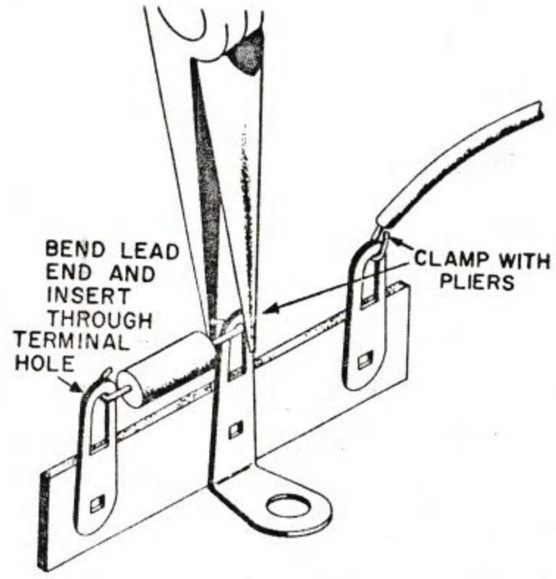
NOTE: Since hardware is weighed rather than counted, you will find you have extra screws, nuts and lockwashers. Also, we have given you extra wire in case you should need some.

☐ Leave the switches, pre-wired sub-assembly and meter in their containers until they are needed. This will protect them from damage.

WIRING HINTS

Follow the step-by-step instructions exactly. Do not attempt to wire your transceiver from only the schematic or pictorials.

A check box has been placed at the beginning of each step; use it to check off each step when it is completed.



As you wire, make good mechanical connections before soldering. Loop wires around terminals and clamp tightly with your pliers. When you mount resistors and capacitors, pull the leads through the terminals so the part is tightly mounted. Keep all leads short.

REMEMBER . . .
THE MOST IMPORTANT PART OF CONSTRUCTION IS SOLDERING.

We suggest you spend some time studying the soldering instructions and pictures on page 3 before you proceed. The completed solder connection should have a shiny metallic finish. If it is not shiny, reheat it and add a little solder.

The wire supplied with your kit is precut and prestripped. Be sure to use the color that is called for. Flexible tubing is provided to cover bare wires and leads when called for, or whenever you think there is a possibility that a lead will touch nearby leads or the chassis.

The resistors for your kit are supplied on plainly marked cards. Do not remove the resistors from the cards until you need them. Five sizes of resistors are supplied. In order of increasing sizes, these are: ¼, ½, 1, 2 and 7-watt units. The majority of them are the ½-watt size. Unless otherwise specified in the instruction step, the resistor called for is ½-watt.

You need only a screwdriver, longnose pliers, wire cutters and a soldering iron to construct your unit.

Check your work frequently. It is a good rule to go back over your work at the end of each page.

Remember to take your time and work slowly. Your efforts will be rewarded with a fine piece of "ham gear."

THIS KIT MUST BE PROPERLY SOLDERED!

USE ENOUGH HEAT

This is the main idea of good soldering. Apply enough heat to the metal surfaces you are joining to make the solder spread freely, until the contour (shape) of the connection shows under the solder.

AN ELECTRONIC UNIT WILL NOT WORK . . . unless it is properly soldered. Read these instructions carefully to understand the basic ideas of good soldering.

Enough heat must be used so the solder can actually penetrate the metal surfaces, making an unbroken path over which electricity can travel. You are not using enough heat if the solder barely melts and forms a rounded ball of rough, flaky solder.

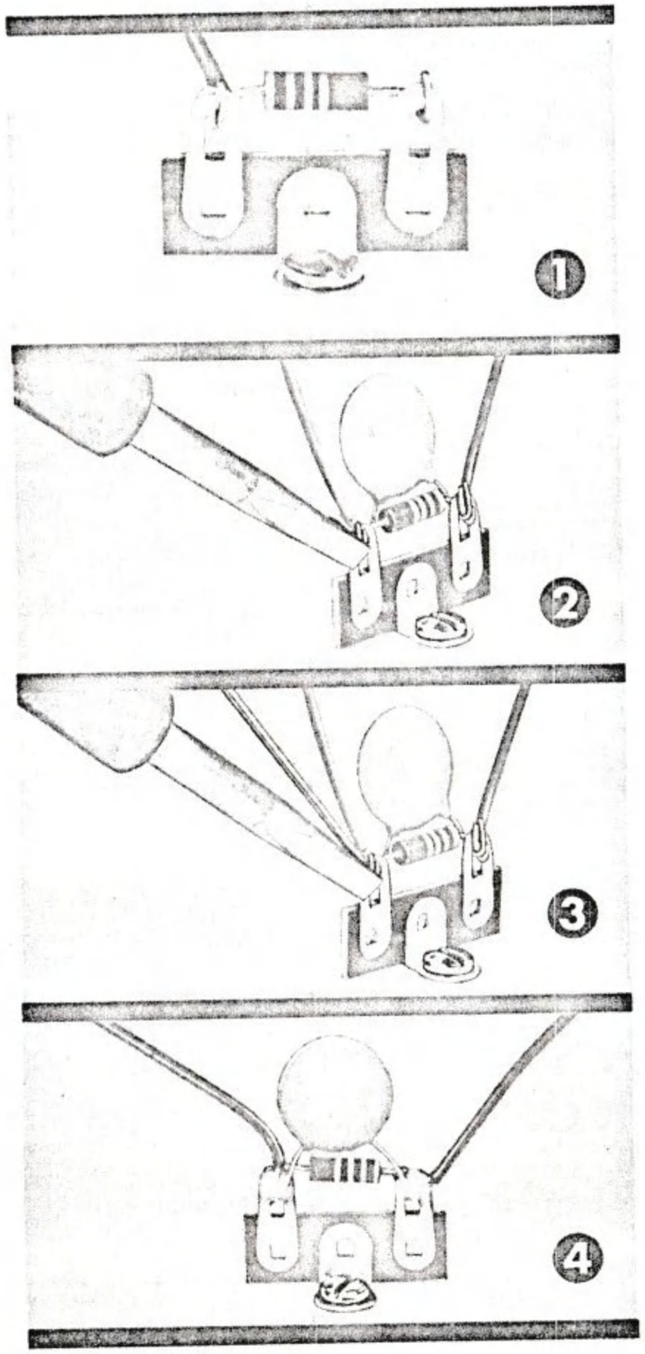
Use the Right Soldering Tool

A soldering iron in the 27-40 watt range is recommended. Any iron in this range with a clean, chisel-shaped tip will supply the correct amount of heat to make a good solder connection. You may also use a solder gun but make sure the tip reaches full heat before you solder.

Keep the iron or gun tip brightly coated with solder. When necessary, wipe the hot tip clean with a cloth. If you are using an old tip, clean it before you start soldering.

Use Only Rosin Core Solder

We supply the right kind of solder *(rosin core solder)*. Do not use any other kind of solder! **Use of Acid Core Solder, Paste, or Irons Cleaned on a Sal Ammoniac Block will ruin any Electronic Unit and will Void the Guarantee.**



HERE'S HOW TO DO IT . . .

1. Join bare metal to bare metal; insulation must be removed. Make good mechanical connections and keep resistor and capacitor leads as short as possible, unless otherwise specified.

2. Coat the tip of a hot iron with solder. Then **Firmly Press the Flat Side of the Tip** against the parts to be soldered together. Keep the iron there while you . . .

3. Apply the solder between the metal to be soldered and the iron tip. Use only enough solder to flow over all surfaces of the connection, and all wires in the connection. Remove the iron.

Do Not Move Parts Until the Solder Hardens. If you accidentally move the wires as the solder is hardening, apply your iron and reheat.

4. Compare your soldering with the pictures on this page. You have a good connection if your solder has flowed over all surfaces to be connected, following the shape of the surfaces. It should appear smooth and bright and all wires in the connection should be well-soldered.

You Have Not Used Enough Heat: If your connection is rough and flaky-looking, or if the solder has formed a round ball instead of spreading.

The difference between good soldering (enough heat) and poor soldering (not enough heat) is just a few extra seconds with a hot iron **firmly** applied. REMEMBER, LARGER METAL SURFACES TAKE A LONGER TIME TO HEAT.

FIRST PARTS MOUNTING ON THE BOTTOM OF THE CHASSIS

SEE FIGURE 1.

☐ Place the chassis in front of you as shown.

Mark the tube numbers, switch numbers and control numbers on the chassis with a soft lead pencil or crayon. This will help you identify terminals and tube sockets quickly, as you wire the transceiver.

☐ Four large grommets. Press into the holes shown.

☐ One medium grommet. Press into the hole shown.

☐ Four small grommets. Press into the holes shown.

☐ J-3 mic connector. Remove the two nuts and lockwasher from the connector. Discard the lockwasher. Mount the connector on the front of the chassis with the keyway (slot in the side) to the left. Fasten with the hex nut. To keep the knurled nut from being misplaced, temporarily thread it onto the connector.

☐ J-2, headphone jack. Position as shown and mount with a **large-tooth** lockwasher and hex nut.

☐ S-2, 3 and 5 rocker switches. Mount each from the front of the chassis. Fasten each with two #4 self-tapping screws. **S-5 is the red switch.**

☐ S-4 rotary switch. Position S-4 so the locating tab engages the hole in the chassis. Fasten with a **large-tooth** lockwasher and hex nut.

☐ R-9, 1K control and R-30, 1 meg control. Place a large solder lug over the shaft of each and mount to the chassis with a **large-tooth** lockwasher and nut. Position the solder lugs next to the terminals shown.

☐ R-32, 1 meg control. Mount on the chassis with the terminals positioned as shown. Twist the mounting tabs ¼ turn to fasten.

☐ R-2, 1K control. Mount on the rear of the chassis. Fasten by twisting the mounting tabs ¼ turn.

☐ V-1, V-9, V-8, and V-6, 9-pin tube sockets and large shield bases. Mount each with two 4-40 x ¼" screws, lockwashers and nuts as shown in Figure 2. **Position the sockets so the keyways (wide space between two pins) are properly positioned.**

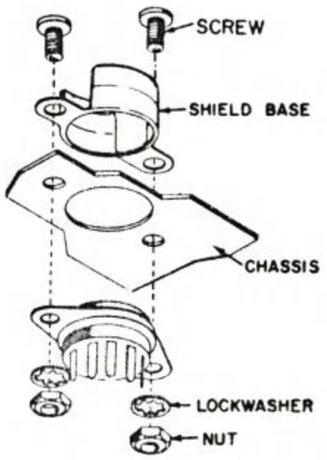


FIGURE 2

☐ V-2, 3 and 4,7-pin tube sockets and small shield bases. Mount each as above. **Be sure to position the socket keyways as shown.**

☐ V-7, small 8-pin tube socket. Mount with two 6-32 x 5/16" screws, four small metal washers, three solder lugs and two nuts. Place two washers over each screw, between the chassis and socket (so the socket is spaced away from the chassis). Place the solder lugs over the mounting screws and fasten with nuts. **Be sure to position the keyway as shown.**

☐ V-5, large 8-pin tube socket. Mount with two 6-32 x 5/8" screws, two metal spacers, one solder lug, one lockwasher and nuts. Place the spacers between the chassis and the socket. **Position the keyway as shown.**

☐ T-1 (113-279), T-2 (113-280) and T-3 (113-281) I.F. transformers. **Position the color dot as shown.** Mount each with a "U" shaped clip as shown in Figure 3.

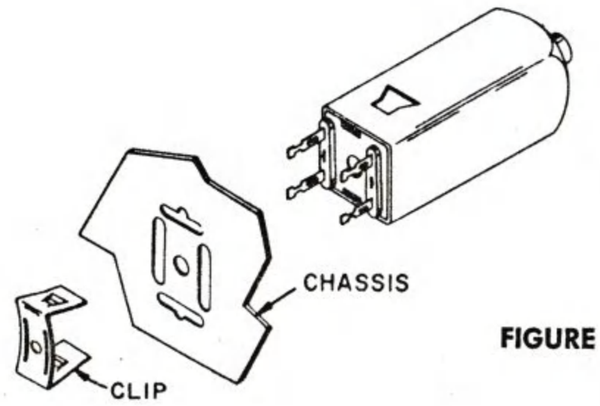


FIGURE 3

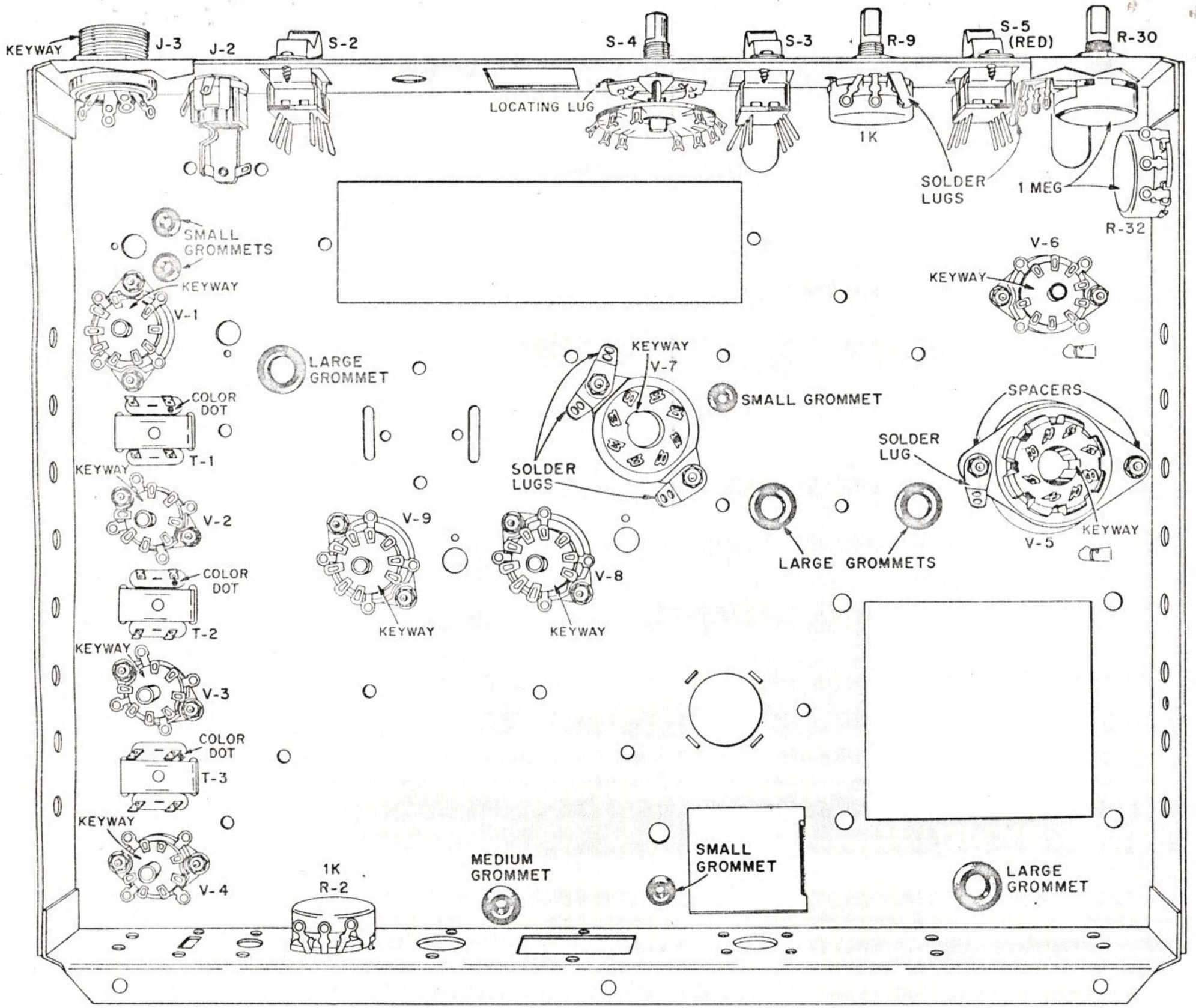

KEYWAY
J-3
J-2
S-2
S-4
S-3
R-9
S-5
(RED)
R-30
LOCATING LUG
1K
SOLDER
LUGS
1 MEG
R-32
SMALL
GROMMETS
KEYWAY
V-1
V-6
KEYWAY
LARGE
GROMMET
KEYWAY
V-7
SMALL GROMMET
SPACERS
SOLDER
LUG
COLOR
DOT
T-1
SOLDER
LUGS
KEYWAY
V-2
V-9
V-8
V-5
KEYWAY
LARGE GROMMETS
COLOR
DOT
T-2
KEYWAY
KEYWAY
KEYWAY
V-3
COLOR
DOT
T-3
KEYWAY
V-4
1K
R-2
MEDIUM
GROMMET
SMALL
GROMMET
LARGE
GROMMET

FIGURE 1

SECOND PARTS MOUNTING ON THE BOTTOM OF THE CHASSIS

SEE FIGURE 4.

There are a number of different types of terminal strips. Be sure to mount the correct ones. Follow the construction illustrations carefully for proper identification.

☐ TS-1, 13-terminal strip. Mount with two 6-32 x ¼" screws, four lockwashers and two nuts. Place a lockwasher between the mounting foot and the chassis and another under the nut.

☐ TS-2, 4-terminal strip. Mount with a 6-32 x ¼" screw, two lockwashers and a nut. Again, use a lockwasher on each side of the mounting foot.

☐ TS-3, 3-terminal strip. Mount with a 6-32 x ¼" screw, two lockwashers and a nut.

☐ TS-4, 4-terminal strip. Mount with a 6-32 x ¼" screw, two lockwashers and a nut.

☐ TS-5, 2-terminal vertical terminal strip. Mount with a 6-32 x ¼" screw, two lockwashers and a nut.

☐ TS-6, 7-terminal strip. Mount with a 6-32 x ¼" screw, two lockwashers and a nut.

☐ TS-7, 4-terminal strip. Mount with a 6-32 x ¼" screw, two lockwashers and a nut. **Be sure you use the correct terminal strip for TS-7 — note where the mounting foot is.**

☐ TS-11, 1-terminal strip. Temporarily mount with a 6-32 x ¼" screw, lockwasher and nut.

☐ S-1 slide switch (with white button). Mount from inside the chassis and fasten with two 6-32 x ¼" screws and lockwashers. Place the lockwasher under the screw-head. Position the switch so the side with the blank space (no terminal) is toward the outside edge of the chassis.

☐ J-7, VFO input jack. Position as shown and mount with two 6-32 x ¼" screws, two lockwashers and two nuts.

☐ J-9, VFO power jack. Position with the flat side, and mount with two 4-40 x ¼" screws, a lockwasher, a solder lug and two nuts. Position the solder lug as shown.

☐ Antenna connector. Mount with four 4-40 x ¼" screws, a solder lug, three lockwashers and four nuts. Position the solder lug as shown.

☐ Two fuse holders. Mount each with a 6-32 x 5/16" screw, lockwasher and nut.

☐ C-60, 40/10/40/30 μf electrolytic capacitor, in metal can. **Position the capacitor so the symbols are properly oriented.** Mount by inserting the four mounting tabs into the chassis holes. Fasten by twisting the mounting tabs ¼ turn.

☐ K-1 relay. Position the terminals as shown and mount with **a 6-32 x** 5/16" screw and lockwasher threaded into the base of the relay. Be sure the locating tab engages the slot in the mounting lip. See Figure 17 for an illustration of the top of the chassis and the relay position.

☐ T-4 power transformer. Position the side with the violet and slate (gray) leads toward the back of the chassis; feed these wires down through the grommet. Mount with four 8-32 nuts and lockwashers.

☐ L-2 receiver oscillator coil, **identified by Part #142-149, or by brown, yellow, red, brown, yellow and white dots.** Position the color dot and mount as shown in Figure 5.

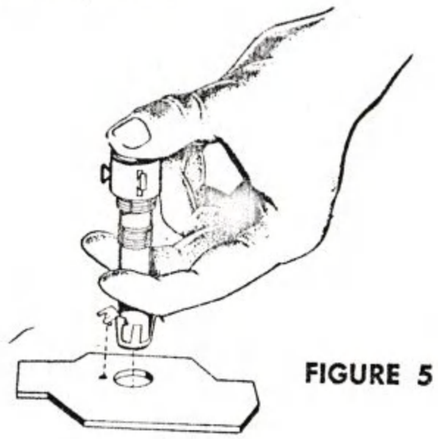


FIGURE 5

☐ L-4, transmitter oscillator coil **identified by Part #142-126, or a blue dot.** Position the color dot as shown. Mount as above.

☐ L-5, transmitter doubler coil, **identified by Part #142-147, or a white dot.** Position the color dot as shown and mount as above.

☐ Mark the terminal strip, coil, switch and jack numbers on the chassis with a pencil or crayon.

☐ Bend the ground lugs on each tube socket away from the socket pins and down toward the chassis. Also spread the tube socket pins slightly outward to provide more spacing between pins.

☐ Check to be sure each screw is tightened securely. This is important because many of the screws provide a mechanical and electrical connection for the ground circuits when the wiring is added.

☐ Are the mounting tabs of C-60 twisted sufficiently, to hold the capacitor firmly?

☐ Do you have the correct terminal strips mounted? Are they positioned correctly?

May we suggest a rest? Set your kit aside for a few hours and do something else. We know you are eager to finish, but you will find that you enjoy building far more if you work for two hours or less at one sitting.

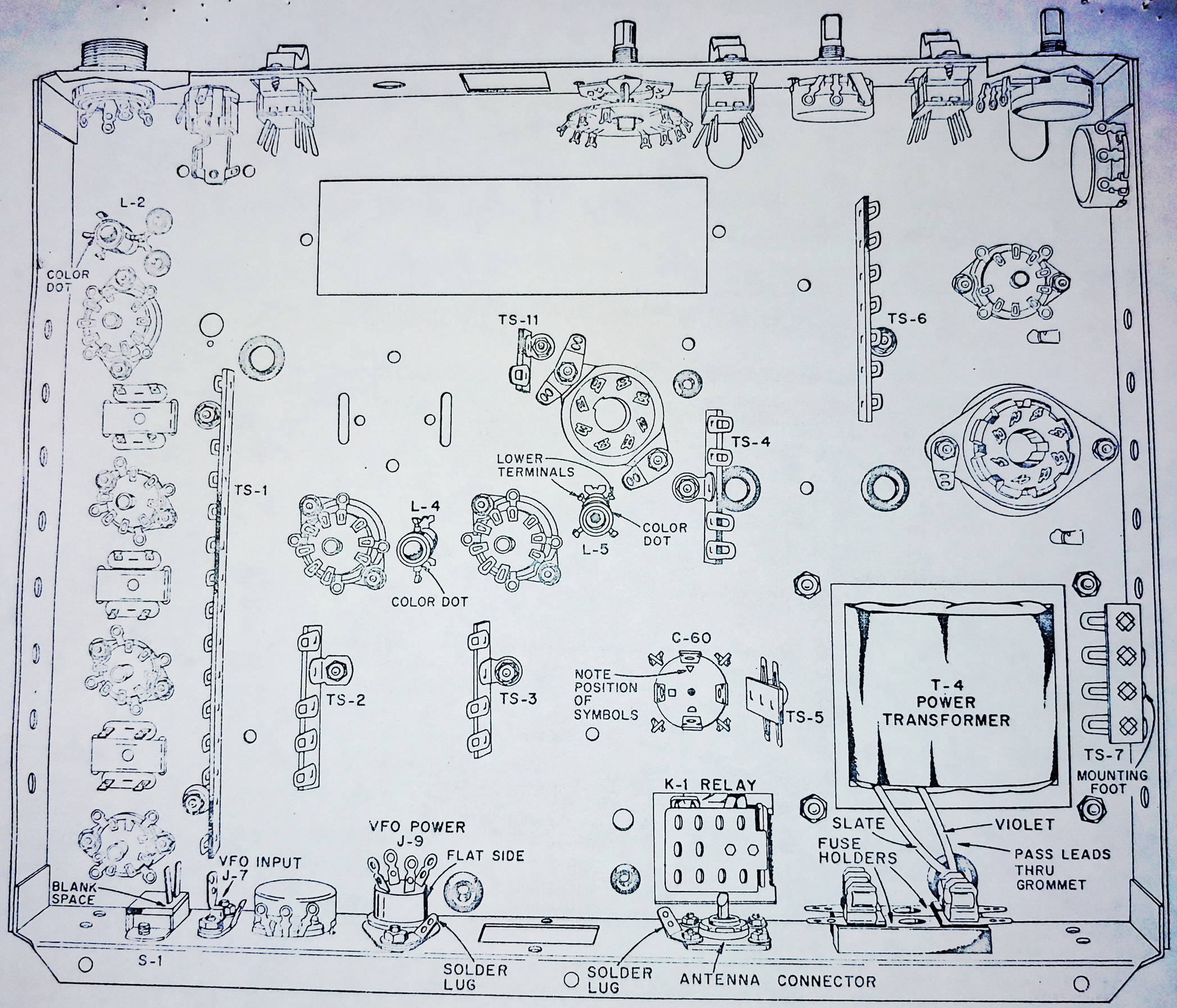

L-2
COLOR DOT
TS-1
TS-11
TS-6
TS-4
LOWER TERMINALS
L-4
L-5
COLOR DOT
COLOR DOT
TS-2
TS-3
C-60
NOTE POSITION OF SYMBOLS
TS-5
T-4 POWER TRANSFORMER
TS-7
MOUNTING FOOT
K-1 RELAY
SLATE
VIOLET
FUSE HOLDERS
PASS LEADS THRU GROMMET
VFO POWER J-9
FLAT SIDE
VFO INPUT J-7
BLANK SPACE
S-1
SOLDER LUG
SOLDER LUG
ANTENNA CONNECTOR

FIGURE 4

FIRST WIRING ON THE BOTTOM OF THE CHASSIS

IMPORTANT INSTRUCTIONS

THE INSTRUCTION CONNECT MEANS: Connect the wire or lead to the given point. Make a firm mechanical connection **BUT DO NOT SOLDER AT THIS TIME.** Later another wire(s) will be connected to this point.

THE INSTRUCTION SOLDER MEANS: Connect the wire or lead to the given point and then solder the connection and all wires in it. If there is more than one wire in the connection, the number will be stated — for example (2 wires). After soldering a connection, trim all wires as close as possible to the terminal.

You are about to start the most important part of your construction — SOLDERING. Carefully study the pictures and instructions given on page 3 before you go on. Take your time and be sure each solder connection is well made.

SEE FIGURE 6.

Suggestion: You may find it helpful to temporarily mount the back plate so the chassis will be held in a horizontal position as you proceed with the wiring. See Figure 24 for a view of the mounted back plate.

☐ 2¼" bare wire. Solder one end to pin 2 of J-3 (the numbers are stamped on the connector next to the pin), thread the other end through terminal 2 of J-2 and solder to terminal 1 of S-2. Solder terminal 2 of J-2.

NOTE: In most cases we are specifying longer bare wire lengths than necessary; this makes them easier to handle. In these cases, after the connection is made, cut off the excess length. Also, you may find some of the insulated wires a little too long; if you desire, you may trim the wires to a shorter length for appearance.

☐ 1" of bare wire and ½" of tubing. Connect one end to ground lug D of V-1. Slip the tubing over the wire and solder the other end to the center pin of V-1.

☐ 1" bare wire and ½" of tubing. Solder one end to terminal 1 of T-1. Slip the tubing over the wire and solder the other end to pin 6 of V-1.

☐ ¾" bare wire. Connect one end to terminal 4 of T-1. Solder the other end of pin 1 of V-2.

☐ ¾" bare wire. Thread it through the center pin of V-2, through pin 2 and connect to ground lug B of V-2. Solder pin 2.

☐ ¾" bare wire. Solder one end to pin 5 of V-2. Solder the other end to terminal 1 of T-2.

☐ ¾" bare wire. Connect one end to terminal 4 of T-2. Solder the other end to pin 1 of V-3.

☐ ¾" bare wire. Thread it through the center pin of V-3, through pin 2 and connect it to ground lug B of V-3. Solder pin 2 and the center pin.

☐ ¾" bare wire. Solder one end to pin 5 of V-3. Solder the other end to terminal 1 of T-3.

☐ ¾" bare wire. Solder one end to pin 1 of V-4. Solder the other end to terminal 4 of T-3.

☐ Is the tip of your soldering iron clean and brightly coated with solder? For good soldering, you must keep the tip of the iron clean and brightly coated with solder. Frequently wipe the tip of your iron on a rag to keep it clean.

☐ 1¼" bare wire. Thread the wire through pin 6 of V-4, the center pin, pin 4 and solder to ground lug C of V-4. Solder pins 4 and 6 and the center pin.

☐ 1½" bare wire. Thread the wire through the center pin of V-9, through pin 4 and connect to ground lug B.

☐ ¾" bare wire. Solder one end to pin 7 of V-9. Solder the other end to the center pin (2 wires).

☐ 1" bare wire and ½" tubing. Connect one end to the center pin of V-8. Connect the other end to ground lug C.

☐ 1¼" bare wire and ¾" tubing. Solder one end to pin 7 of V-8. Solder the other end to terminal 3 of L-5.

☐ 1½" of bare wire and ¾" of tubing. Solder one end to the solder lug mounted with J-9. Slip the tubing over the wire and solder the other end to terminal 1 of J-9. Note that the terminal numbers are stamped on the body of the connector.

☐ Either red wire from T-4. Connect to terminal 1 of C-60.

☐ Remaining red wire from T-4. Connect to terminal 2 of TS-5.

☐ Brown wire from T-4. Connect to the chassis ground post shown. Bend this ground post upward to allow more room for connections.

☐ Black wire from front of T-4 (do not use the black wire which comes out of the rear of T-4. Position as shown and solder to terminal 2 of the upper fuse holder.

☐ Orange wire from T-4. Route as shown and connect to terminal 1 of TS-7.

☐ Check to be sure none of the bare wires just installed are touching nearby terminals or the chassis. Be sure to clip off any excess wire ends.

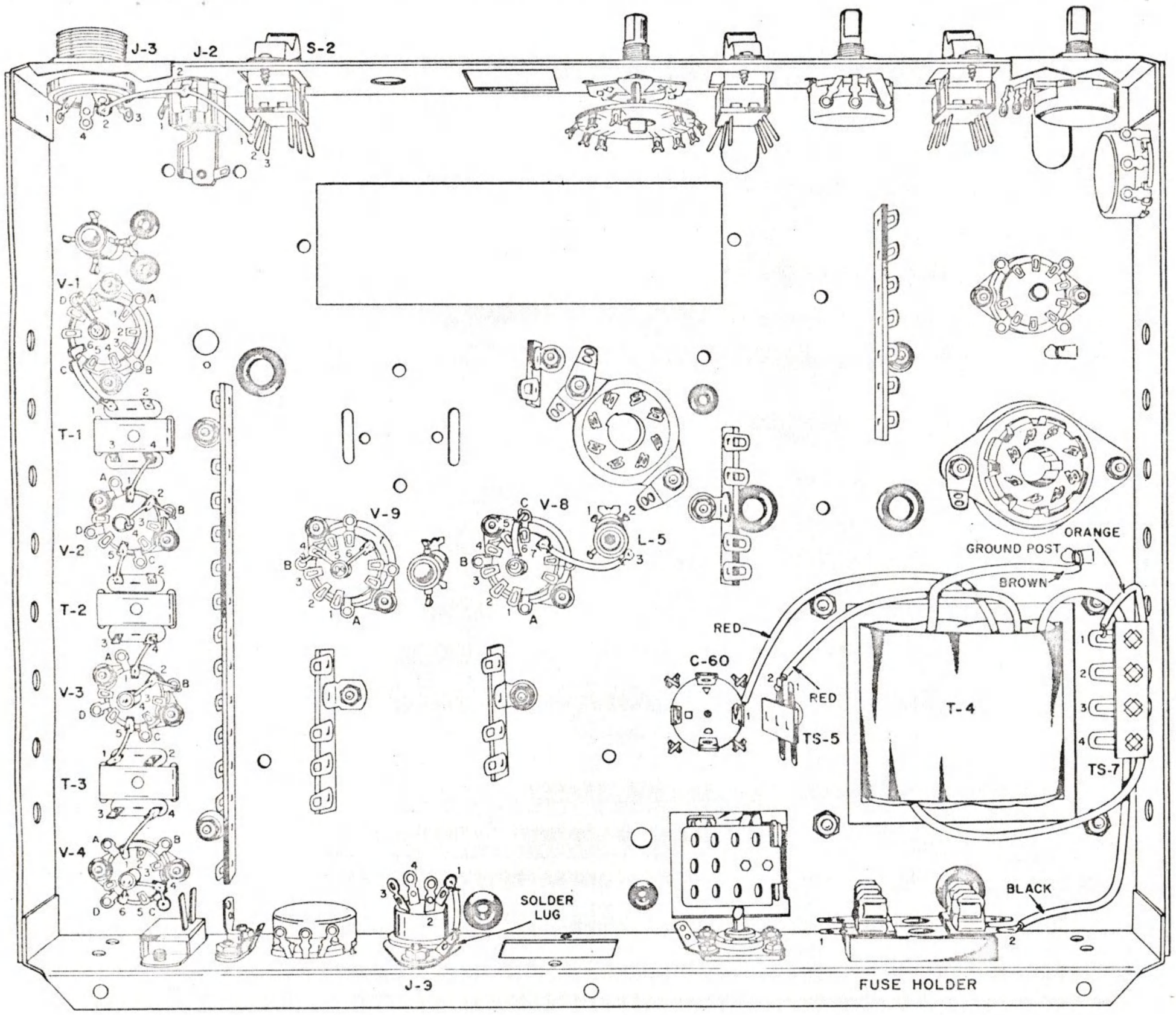

J-3
J-2
S-2
V-1
T-1
V-2
T-2
V-3
T-3
V-4
V-9
V-8
L-5
C-60
RED
RED
TS-5
T-4
TS-7
ORANGE
GROUND POST
BROWN
BLACK
SOLDER LUG
J-3
FUSE HOLDER

FIGURE 6

SECOND WIRING ON THE BOTTOM OF THE CHASSIS

SEE FIGURE 7.

- ☐ 1¼" bare wire. Solder one end to ground lug D of V-1 (2 wires). Connect the other end to terminal 3 of L-2.
- ☐ 1" bare wire and ½" of tubing. Solder one end of the wire to pin 8 of V-1. Slip the tubing over the wire and solder it to terminal 2 of L-2.
- ☐ 1¾" bare wire and 1¼" of tubing. Connect one end to terminal 4 of L-2. Push the other end through the grommet, to be connected later.
- ☐ 1¼" bare wire and ¾" of tubing. Connect one end of the wire to pin 2 of V-4. Slip the tubing over the wire and solder it to terminal 1 of S-1.
- ☐ 1" bare wire. Thread through terminals 2, 3 and 4 of S-4. Solder terminals 2 and 3.
- ☐ Bend the solder lug that was mounted with R-9 down over terminal 3 and solder it.
- ☐ Bend the solder lug mounted with R-30 down over terminal 3 (lowest terminal). Do not solder this connection; all the wires which are connected to terminal 3 must also connect to this solder lug.
- ☐ Orange wire. Solder one end to pin 4 of V-1. Connect the other end to pin 4 of V-2.
- ☐ Orange wire. Connect one end to pin 4 of V-2. Connect the other end to pin 4 of V-3.
- ☐ Orange wire. Solder one end to pin 3 of V-3. Solder the other end to pin 3 of V-4.
- ☐ Orange wire. Connect one end to pin 2 of V-4. Connect the other end to terminal 9 of TS-1.

NOTE: When you connect wires to TS-1, double-check your count of the terminals to be sure you are connecting to the correct one. Or, you may prefer to mark the terminal numbers on the chassis.

- ☐ Yellow wire. Connect one end to pin 7 of V-4. Route the other end as shown and connect to terminal 10 of TS-1.
- ☐ Orange wire. Connect one end to terminal 2 of TS-1. Connect the other end to terminal 7 of TS-1.
- ☐ Orange wire. Connect one end to terminal 1 of TS-1. Connect the other end to terminal 6 of TS-1.
- ☐ Orange wire. Solder one end to pin 5 of V-9. Connect the other end to pin 5 of V-8.
- ☐ Orange wire. Connect one end to terminal 2 of TS-2. Connect the other end to terminal 3 of TS-3.
- ☐ Is the tip of your soldering iron clean and brightly coated with solder? It should be.
- ☐ Red wire. Connect one end to terminal 3 of R-30. Solder the other end to terminal 1 of R-32.
- ☐ 1" bare wire. Thread through the center pin of V-6, pin 4 and connect to ground lug B. Solder the center pin and pin 4.

NOTE: Keep all of the wires and leads connected to V-7, V-8 and V-9 as short as possible. Lead positioning and length is very important in these three stages.

- ☐ 2" bare wire. Thread through pin 8 of V-7 through the solder lug and connect to pin 7. Solder pin 8 and the solder lug.
- ☐ 1¾" bare wire. Thread through pin 1 of V-7. Connect one end to pin 4. Connect the other end to pin 6.
- ☐ Orange wire. Solder one end to terminal 3 of J-3. Route the other end as shown and connect to terminal 2 of S-2.
- ☐ Orange wire. Solder one end to pin 5 of V-1. Connect the other end to pin 3 of V-2.

NOTE: Remember to keep all of these wires positioned down against the chassis.

- ☐ Yellow wire. Connect one end to pin 5 of V-6. Connect the other end to pin 2 of V-5.
- ☐ Orange wire. Connect one end to terminal 7 of TS-6. Connect the other end to pin 4 of V-5.
- ☐ Blue wire. Connect one end to terminal 7 of TS-6. Connect the other end to terminal 4 of L-5.
- ☐ Orange wire. Connect one end to terminal 1 of TS-4. Connect the other end to terminal 1 of TS-11.
- ☐ At the end of every major wiring sequence, it is a good idea to turn the chassis over and shake it to eliminate all the loose pieces of wire and solder. Do so at this time.
- ☐ Now is a good time to stop and carefully check your work:
  1. Go back over these steps and Figure 6 to be sure all wires have been put in and are connected to the correct points.
  2. Do all solder connections have a shiny metallic finish? If not, the connection should be reheated — add a little solder if necessary.
  3. Has any solder run down a terminal to touch the chassis, or has excess solder on a connection run between two terminals? If so, heat the connection with your soldering iron to draw away the excess solder.
  4. Do any of the tube socket pins touch each other? They should not! Correct this before you go on.
  5. Have you clipped off all excess wire ends? Remember, in most cases the bare wire lengths specified are longer than necessary. Be sure to cut off all excess wire ends. Any such loose ends can touch nearby terminals, or the chassis, and this makes problems — they may even keep your transceiver from working.

Always check for possible problem areas at the end of each wiring sequence. A little time spent now can save you much time later on if the unit does not operate properly.

- ☐ How about another rest? You really deserve one.

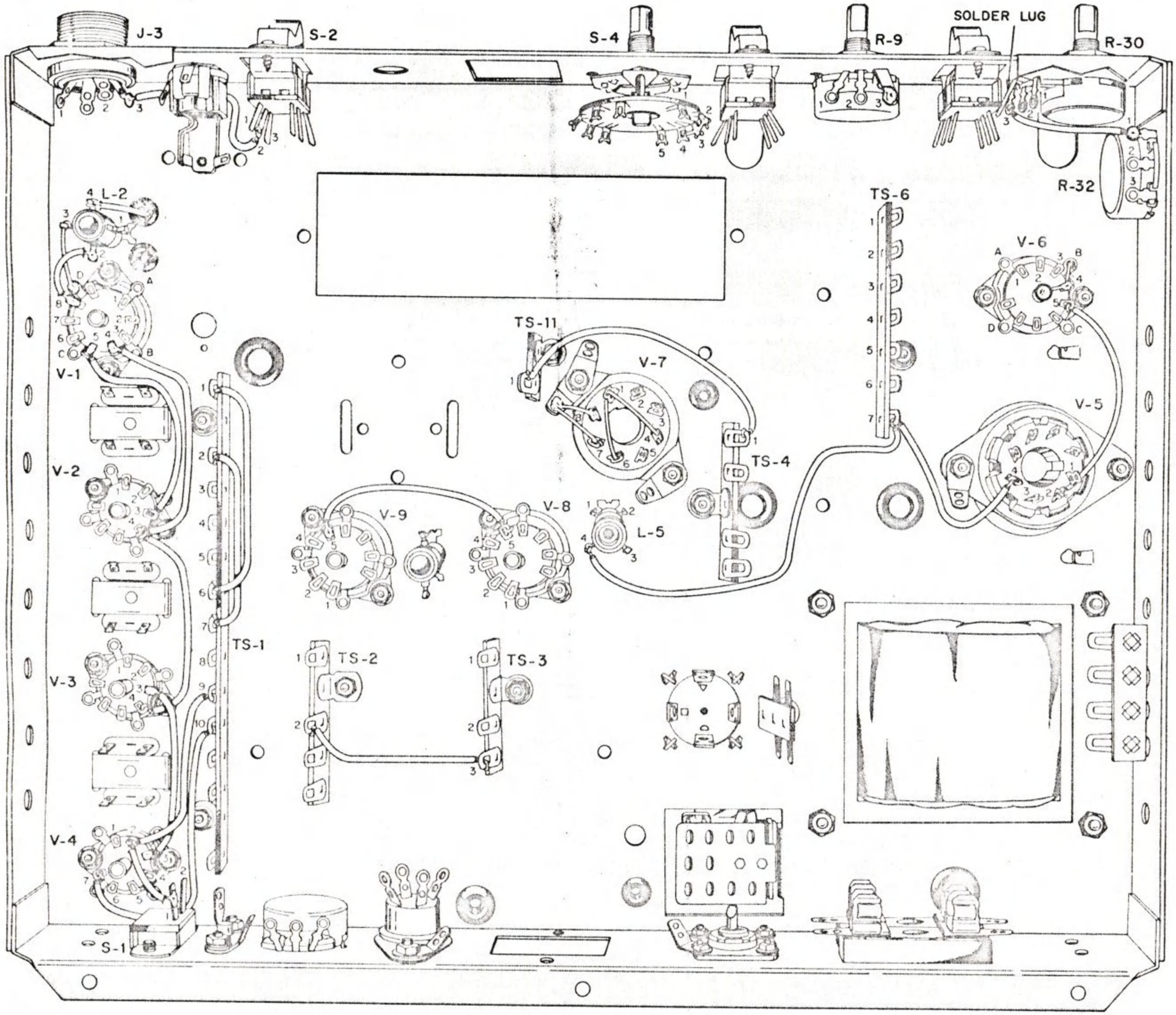

J-3
S-2
S-4
R-9
SOLDER LUG
R-30
R-32
L-2
V-1
V-2
V-3
V-4
S-1
TS-1
TS-2
TS-3
TS-11
V-7
TS-4
V-9
V-8
L-5
TS-6
V-6
V-5

FIGURE 7

THIRD WIRING ON THE BOTTOM OF THE CHASSIS

SEE FIGURE 8.

☐ Temporarily position the 12-pin chassis-mounting power connector, J-8, for easy wiring, near the rear of the chassis. Notice that the body of J-8 has numbers stamped next to the terminals; **position J-8 so the terminals numbered 1, 4, 7, 10 are toward the center of the chassis.**

NOTE: You may find it helpful to temporarily mount one end of J-8 in the hole on the rear lip of the chassis while wiring.

☐ Small clip nut. Snap over the mounting hole on J-8 as shown. Position the clip with the raised side up.

☐ **Heavy yellow** wire from T-4. Route as shown and solder to terminal 1 of J-8.

CAUTION: From now on, there are some sections where the wiring is very close; take care not to burn adjacent wires as you solder.

☐ Black wire from T-4. Route as shown and solder to terminal 4 of J-8.

☐ Blue wire from T-4. Route as shown and solder to terminal 10 of J-8.

☐ Green/yellow wire from T-4. Route as shown and solder to terminal 5 of J-8.

The majority of the wiring in this unit is accomplished through a harness. This harness greatly simplifies wiring and contributes to a neat over-all appearance.

☐ Open the harness carefully, spreading out each section. Lay the harness on a large flat surface. Position the branches as shown and form the sections into neat, straight lines. Transfer the harness over to the chassis and position it as shown in the Figure. Press all sections firmly down against the chassis and route the wires so they are near their contributing points.

Connect the wires from the upper left as follows:

☐ Green wire. Solder to terminal 1 of J-2.

☐ Black wire. Solder to terminal 3 of J-2.

☐ Violet wire. Solder to terminal 2 of S-2 (2 wires).

You may find that the wires from the harness are a little too long. You can trim them for appearance. Or you can leave the excess length for a "service loop." Then, should you ever find it necessary to disconnect a wire, the excess length may be used to make a neat reconnection.

Moving down the left branch of the harness, connect the wires as follows:

☐ Green wire. Connect to pin 7 of V-1.

☐ Orange, white/orange and blue wires. Insert down through the grommet shown; they will be connected later.

☐ Two red wires. Connect both to terminal 7 of TS-1.

☐ Two white/red wires. Connect both to terminal 1 of TS-2.

☐ Blue wire. Connect to terminal 12 of TS-1.

☐ Two white/orange wires. Connect both to terminal 13 of TS-1.

☐ Is the tip of your soldering iron clean? Remember to wipe it frequently.

☐ Brown wire. Solder to pin 4 of V-3 (2 wires).

☐ White/brown wire. Connect to pin 3 of V-2.

Moving along the bottom branch of the harness . . .

☐ White/orange and white/brown wires. Insert down through the grommet shown.

☐ **Thin white** wire. Solder to terminal 7 of J-8.

☐ **Heavy yellow** wire from the harness. Solder to terminal 2 of J-8.

☐ Position the remainder of this section as illustrated:

Connect the wires from the upper right as follows:

☐ **Long blue** and **long thin black** wires. Insert down through the cut-out as shown.

☐ **Heavy black wire.** Strip off an extra ¼" of insulation from the end. Route under the controls and switches as shown. Insert through terminals 2 and 5 of S-5. Solder both terminals.

☐ **Heavy white** wire. Route under the controls and switches as shown. Solder to terminal 4 of S-5.

☐ Heavy orange wire. Route as shown and solder to terminal 1 of S-5.

☐ Yellow wire. Solder to terminal 3 of S-3.

☐ **Short blue** wire. Solder to terminal 6 of S-3.

Moving down the branch next to TS-6 . . .

☐ **Any two** of the four blue wires. Solder into the lower hole of terminal 2 of TS-6 (2 wires). The remaining blue wires will be connected later.

☐ Three orange wires. Solder into the lower hole of terminal 4 of TS-6 (3 wires).

Before you go on, be sure the harness and all wires are pressed firmly down against the chassis. More wiring and parts will be added later; if your work is neat and positioned properly, it will be easier to add later wiring. It also will result in a wiring job that you will be proud of.

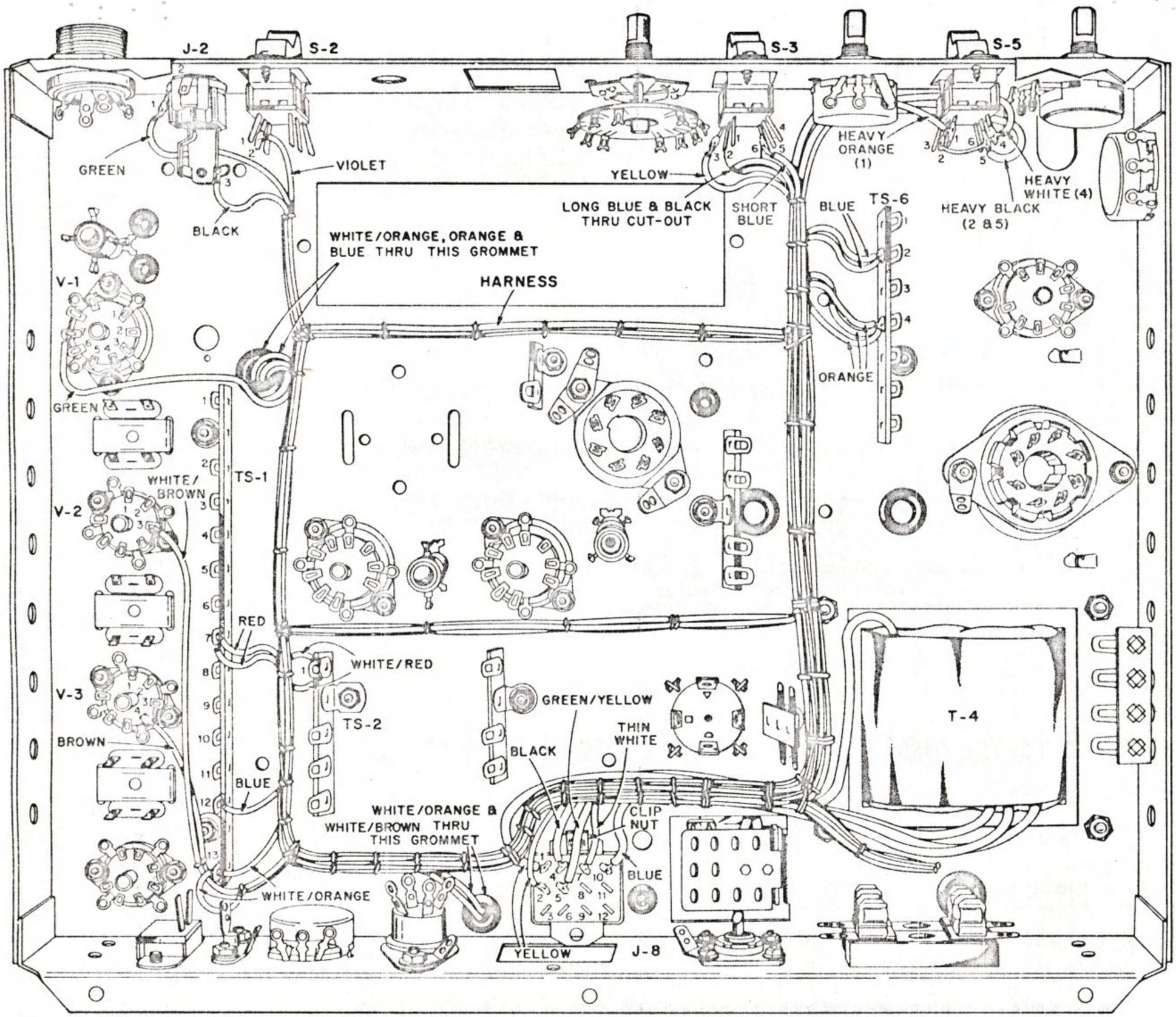

J-2
S-2
S-3
S-5
GREEN
VIOLET
YELLOW
HEAVY ORANGE (1)
HEAVY WHITE (4)
LONG BLUE & BLACK THRU CUT-OUT
SHORT BLUE
BLUE
TS-6
HEAVY BLACK (2 & 5)
BLACK
WHITE/ORANGE, ORANGE & BLUE THRU THIS GROMMET
HARNESS
V-1
ORANGE
GREEN
TS-1
WHITE/ BROWN
V-2
RED
WHITE/RED
V-3
TS-2
GREEN/YELLOW
THIN WHITE
BROWN
BLACK
BLUE
WHITE/ORANGE & WHITE/BROWN THRU THIS GROMMET
CLIP NUT
BLUE
T-4
WHITE/ORANGE
YELLOW
J-8

FIGURE 8

FOURTH WIRING ON THE BOTTOM OF THE CHASSIS

SEE FIGURE 9.

Continue connecting the leads of the harness as follows: Left and bottom branch . . .

☐ Red wire. Connect to terminal 2 of TS-2.

☐ Gray wire. Connect to terminal 3 of TS-2.

☐ Green wire. Connect to terminal 4 of TS-2.

☐ Red wire. Connect to terminal 1 of R-2.

☐ Orange wire. Solder to terminal 2 of R-2.

☐ White wire. Solder to terminal 4 of J-9.

☐ White/red wire. Solder to terminal 3 of J-9.

☐ Two brown wires. Solder both to terminal 2 of J-9 (2 wires).

☐ **Heavy red wire.** Solder to terminal 8 of J-8.

NOTE: Take caution not to burn wires as you solder in areas where there is little room.

☐ **Heavy blue wire.** Solder to terminal 11 of J-8.

☐ **Heavy orange wire.** Solder to terminal 3 of J-8.

☐ **Heavy white** wire. Solder to terminal 6 of J-8.

☐ Three brown wires. Solder all three to terminal 9 of J-8 (3 wires).

☐ Long brown wire. Position as shown and solder to pin 4 of V-8.

☐ Gray wire. Connect to terminal 2 of TS-3.

☐ Yellow wire. Solder to terminal 2 of K-1, relay.

☐ Orange wire. Solder to terminal 4 of K-1, relay.

☐ Red wire. Solder to terminal 5 of K-1, relay. **Do not use one of the red wires that break out of the harness toward C-60.**

☐ Blue wire. Solder to terminal 6 of K-1, relay.

☐ Violet wire. Insert down through the relay cut-out as shown.

Moving across the center branch of the harness . . .

☐ Red wire. Connect to terminal 2 of L-4.

☐ Green wire. Connect to terminal 1 of TS-3.

☐ Blue wire. Connect to terminal 4 of TS-4.

☐ Orange wire. Solder to terminal 3 of C-60.

☐ White/red wire. Solder to terminal 4 of C-60.

☐ Green wire. Solder to terminal 1 of C-60 (2 wires).

☐ Carefully check the wiring of J-8 power connector. Be sure the wires go to the correct terminal. Be sure the wires are touching only the terminals to which they are connected. Also, check to be sure solder does not bridge across, between two terminals.

May we suggest another rest? You will find that you enjoy building more if you work in shorter sessions.



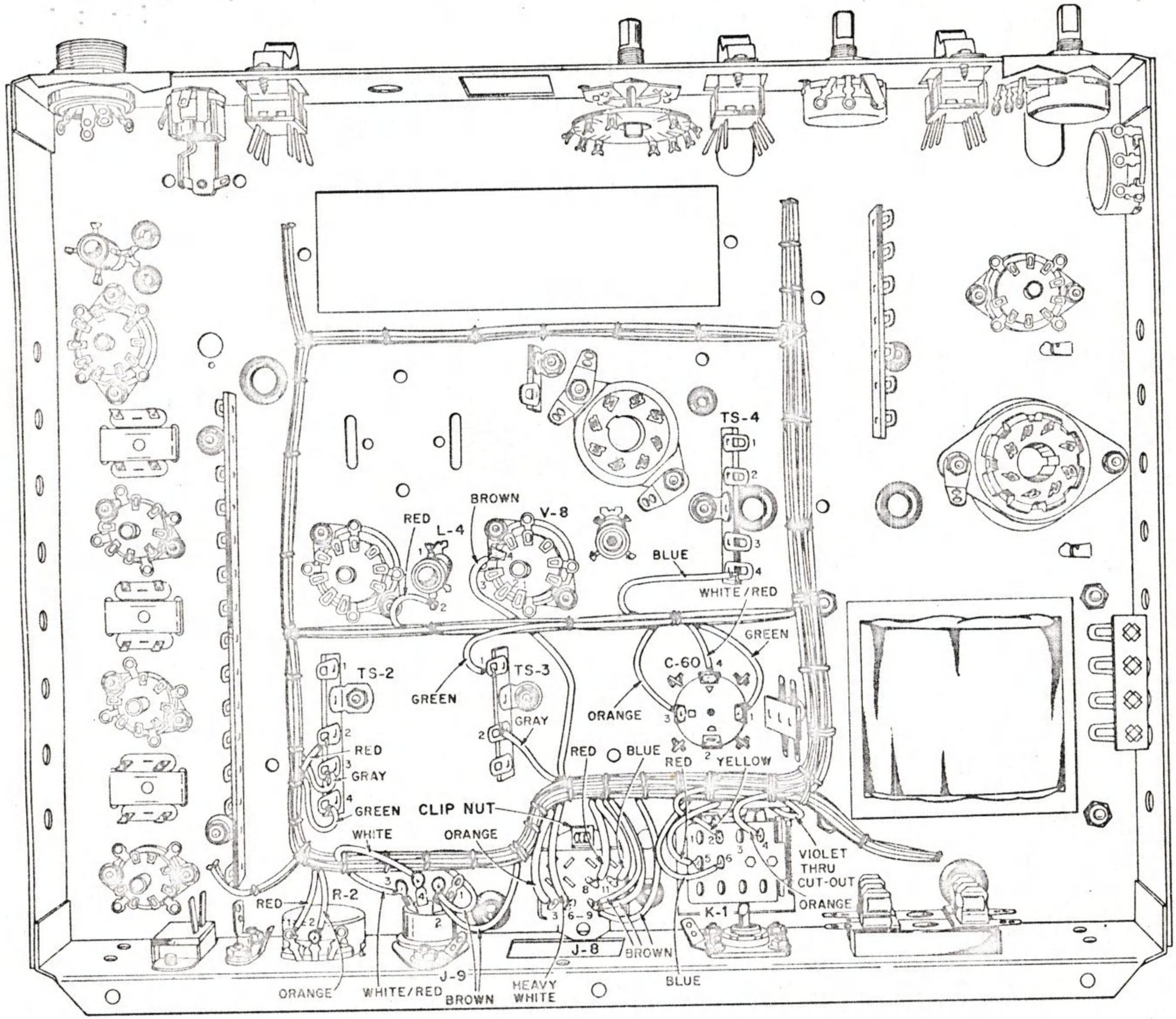

TS-4
1
2
3
4
BROWN
RED
L-4
V-8
BLUE
WHITE/RED
GREEN
C-60
TS-2
TS-3
GREEN
GRAY
ORANGE
RED
GRAY
GREEN
CLIP NUT
RED
BLUE
RED
YELLOW
WHITE
ORANGE
VIOLET
THRU
CUT-OUT
ORANGE
K-1
RED
R-2
J-8
BROWN
J-9
ORANGE
WHITE/RED
BROWN
HEAVY
WHITE
BLUE

FIGURE 9

FIFTH WIRING ON THE BOTTOM OF THE CHASSIS

SEE FIGURE 10.

☐ Mount J-8 with a 6-32 x ¼" screw, threaded into the clip nut. Mount the side nearer the edge of the chassis with a 6-32 x ¼" screw, a solder lug and a nut.

☐ ¾" bare wire. Solder one end to terminal 12 of J-8. Solder the other end to solder lug mounted with J-8.

Continue wiring the harness, from the upper right branch . . .

☐ **Thin white** wire. Solder to terminal 2 of S-3.

☐ Red wire. Solder to terminal 5 of S-3.

NOTE: The orange wire will be connected later.

☐ Green wire. Connect to terminal 1 of TS-6.

☐ Two blue wires. Connect both to terminal 2 of TS-6.

☐ Red wire. Connect to terminal 6 of TS-6.

☐ Gray wire. Connect to terminal 7 of TS-6.

☐ Two yellow wires. Connect both to terminal 1 of TS-4.

☐ Brown wire. Solder to pin 2 of V-7.

☐ Brown wire (the one that breaks out of the harness near terminal 1 of TS-4. Solder to pin 7 of V-5.

☐ Green wire. Connect to terminal 3 of TS-4.

☐ Brown wire. Solder to pin 2 of V-5 (2 wires).

☐ Gray wire. Connect to terminal 1 of TS-5.

☐ Remember to keep the tip of your soldering iron clean and brightly coated with solder.

☐ Two red wires. Solder both to terminal 2 of C-60 (2 wires).

☐ Green wire. Solder to terminal 10 of K-1, relay.

☐ ¾" bare wire. Solder one end to terminal 9 of K-1. Solder the other end to the antenna connector.

☐ Black wire. Solder to terminal 1 of the lower fuse holders.

☐ Heavy white and thin white wire. Solder both to terminal 1 of the upper fuse holder (2 wires).

Connect the wires from the lower right branch as follows:

☐ Red, yellow and blue wires (all laced together). Thread down through the grommet below the fuse holders. You may find it helpful to temporarily dismount the lower fuse holder while you do this.

☐ Heavy white wire. Solder to terminal 2 of the lower fuse holder.

☐ Two red wires. Connect both to terminal 4 of TS-7.

NOTE: The orange harness wire, near S-3, will be connected later.

☐ This completes the wiring of the harness on the bottom of the chassis. Check to be sure you have connected all the wires. Again, press the harness and all other wires down against the chassis.

☐ Red wire. Connect one end to terminal 1 of TS-6. Solder the other end to terminal 2 of R-9.

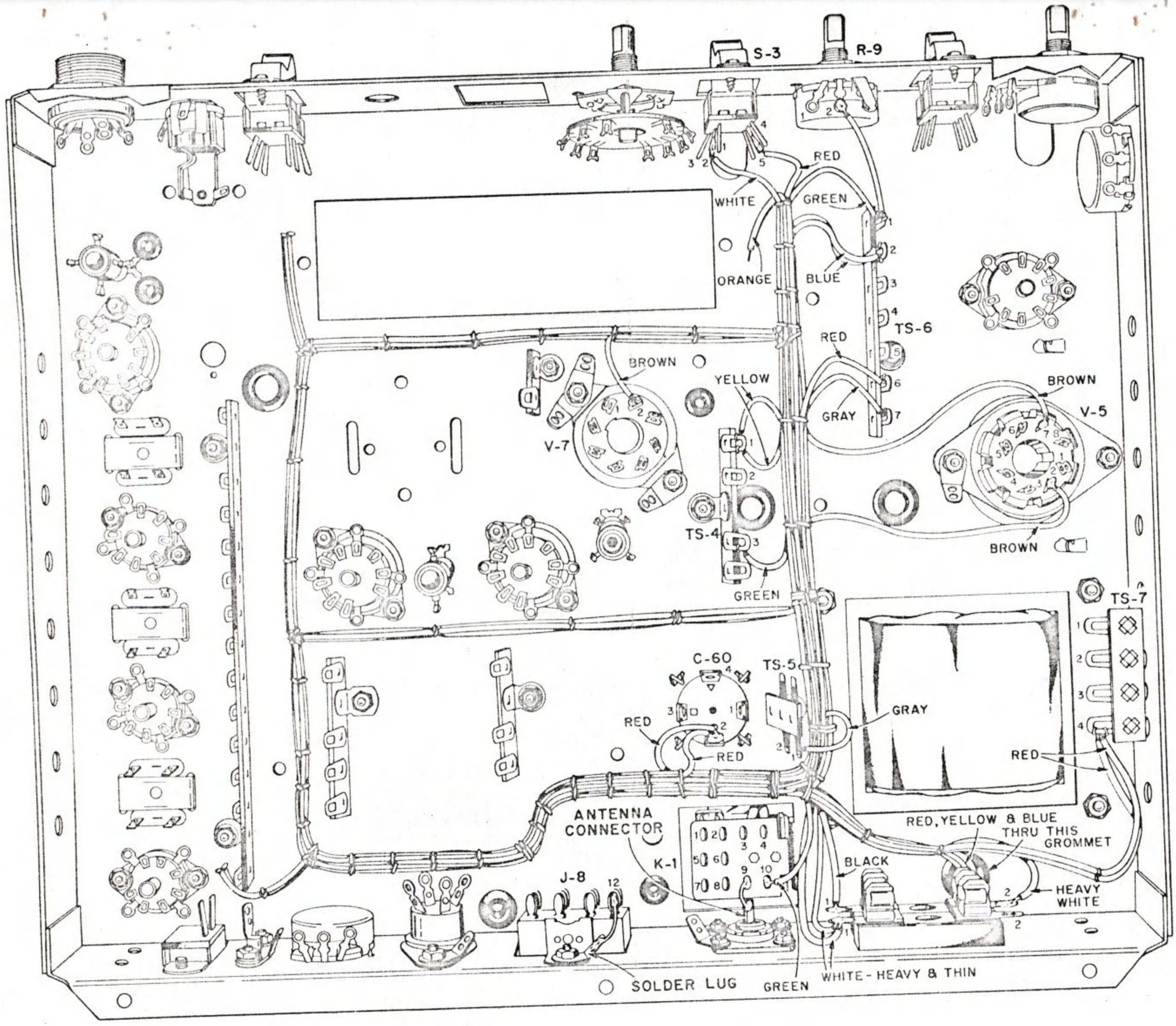

S-3
R-9
RED
WHITE
GREEN
ORANGE
BLUE
TS-6
RED
GRAY
BROWN
YELLOW
V-7
V-5
BROWN
BROWN
TS-4
GREEN
TS-7
C-60
TS-5
RED
RED
GRAY
RED
ANTENNA
CONNECTOR
K-1
J-8
RED, YELLOW & BLUE
THRU THIS
GROMMET
BLACK
HEAVY
WHITE
SOLDER LUG
GREEN
WHITE - HEAVY & THIN

FIGURE 10

SIXTH WIRING ON THE BOTTOM OF THE CHASSIS

You are going to start installing capacitors. It is extremely important that you keep both leads of all capacitors as short as possible. Use only as much of the lead as you require to connect the compenent between the terminals — cut off the excess length. Also, keep the body of the capacitors positioned down near the chassis.

Capacitance values are given in μf (microfarads) and pf (picofarads, or $\mu\mu$f for micro-microfarads, which is the same as pf). The electrolytic capacitors are all in μf. If the unit (μf, pf or $\mu\mu$f) is not stamped next to the value, you can easily tell what unit the value is: if the number is a decimal value, read it as μf; if the number is a whole number, read it as pf.

SEE FIGURE 11.

☐ C-33, 68 pf, silver mica capacitor. Solder one lead to terminal 4 of L-2. Connect the other lead to terminal 1 of L-2.

☐ C-10, 20 pf, disc capacitor. Connect one lead to terminal 1 of L-2. Connect the other lead to pin 9 of V-1.

☐ C-11, .01 μf disc capacitor. Connect one lead to pin 1 of V-1. Connect the other lead to ground lug B of V-1.

☐ C-15, .1 μf disc capacitor. Solder one lead to pin 7 of V-1 (2 wires). Connect the other lead to the ground lug C of V-1.

☐ C-61, .01 μf disc capacitor. Solder one lead to the center pin of V-2 (2 wires). Solder the other lead to pin 3 of V-2 (3 wires).

☐ Is the tip of your soldering iron clean and brightly coated with solder? It should be.

☐ C-27, .1 μf disc capacitor. Connect one lead to ground lug B of V-3. Connect the other lead to terminal 10 of TS-1.

☐ C-23, .01 μf disc capacitor. Connect one lead to ground lug D of V-3. Connect the other lead to terminal 3 of T-3.

☐ C-54, .005 μf disc capacitor. Connect one lead to pin 8 of V-9. Connect the other lead to ground lug C of V-9.

NOTE: Before using .001 μf disc capacitors, go through the .001 μf capacitors supplied, and remove those rated at 2 KV. Use these capacitors only when 2 KV capacitors are called for.

☐ C-44, .001 μf disc capacitor. Connect one lead to pin 3 of V-7. Connect the other lead to the solder lug.

☐ Are you keeping the leads on the capacitors short? They should be.

☐ C-47, 2200 pf disc capacitor (may be marked .0022). Connect one lead to the solder lug. Solder the other lead to pin 6 of V-7 (2 wires).

☐ C-49, .001 μf disc capacitor. Solder one lead to terminal 4 of L-5 (2 wires). Solder the other lead to ground lug D of V-8.

☐ C-50, .001 μf disc capacitor. Connect one lead to pin 9 of V-8. Connect the other lead to ground lug A of V-8.

☐ C-3, .005 μf disc capacitor. Connect one lead to pin 3 of V-8. Solder the other lead to ground lug A of V-8 (2 wires).

☐ C-34, 220 pf disc capacitor. Slip ½" of tubing over each lead. Connect one lead to pin 1 of V-6. Solder the other lead to terminal 3 of R-32.

☐ C-36, 470 pf disc capacitor. Connect one lead to pin 3 of V-6. Connect the other lead to ground lug B of V-6.

☐ C-37, 5 μf electrolytic capacitor. Connect the lead from the end marked with a + sign to pin 3 of V-6. Connect the other lead to the ground post near V-6. Bend the ground post up slightly for easy access.

☐ C-31, .005 μf disc capacitor. Slip ¾" of tubing over each lead. Connect one lead to pin 6 of V-6. Connect the other lead to pin 5 of V-5.

☐ C-30, 390 pf disc capacitor. Connect one lead to pin 5 of V-5. Connect the other lead to the solder lug mounted with V-5.

☐ C-64, .001 μf, **2 KV** disc capacitor. Connect one lead to pin 3 of V-5. Connect the other lead to the solder lug mounted with V-5.

☐ C-29, 10 μf smaller, low-voltage electrolytic capacitor. Connect the lead from the end marked + to pin 8 of V-5. Connect the other lead to the ground post shown.

☐ C-28, .01 μf disc capacitor. Connect one lead to pin 8 of V-5. Connect the other lead to the ground post shown.

☐ C-57, 10 μf smaller, low-voltage electrolytic capacitor. Connect the + lead to terminal 1 of TS-7. Connect the other lead to terminal 3 of TS-7.

☐ R-59, 56K, ¼-watt resistor with green, blue and orange color bands. Connect one lead to terminal 2 of T-1. Solder the other lead to terminal 4 of T-1 (2 wires).

☐ R-60, 56K, ¼-watt resistor (green, blue, orange). Connect one lead to terminal 2 of T-2. Solder the other lead to terminal 4 of T-2 (2 wires).

☐ Now take time to relax and stretch a little. You will enjoy building your kit even more if you are not tired.

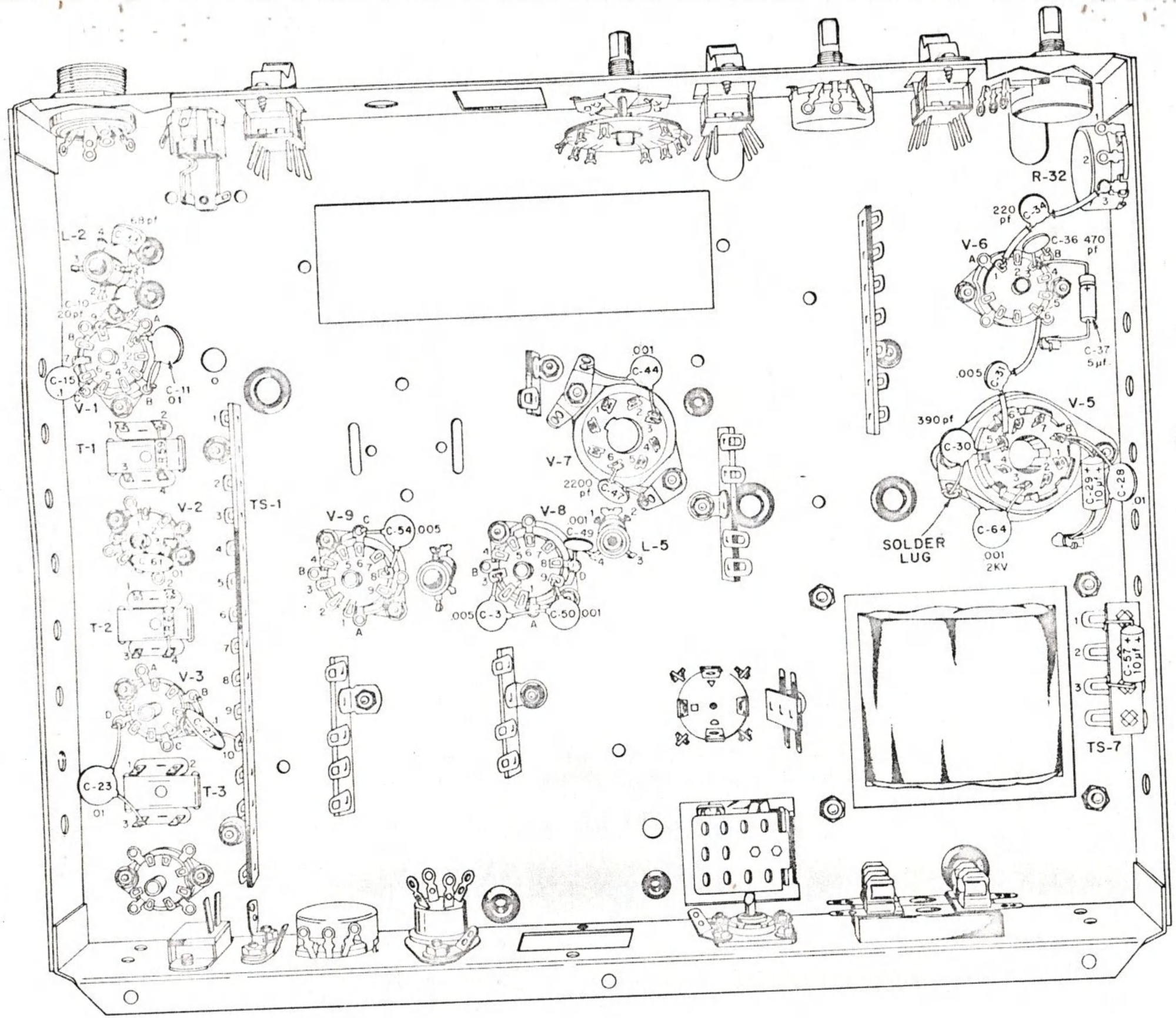

R-32
L-2
6.8pf
C-10
20pf
C-15
.1
C-11
.01
V-1
T-1
V-2
C-61
.01
T-2
V-3
C-23
.01
T-3
TS-1
V-9
C-54
.005
C-3
.005
V-8
C-49
.001
C-50
.001
L-5
V-7
.001
C-44
2200
pf
C-47
V-6
C-34
220
pf
C-36
470
pf
C-37
5µf.
C-31
.005
V-5
390pf
C-30
C-29
10µf
C-28
.01
C-64
.001
2KV
SOLDER
LUG
C-57
10µf
TS-7

FIGURE 11

SEVENTH WIRING ON THE BOTTOM OF THE CHASSIS

SEE FIGURE 12.

☐ C-65, 10 pf NPO disc capacitor. Connect one lead to terminal 3 of L-2. Connect the other lead to terminal 1 of L-2.

☐ C-9, 15 pf N-750 disc capacitor. Solder one lead to terminal 3 of L-2 (3 wires). Solder the other lead to terminal 1 of L-2 (4 wires).

☐ R-6, 82K resistor (gray, red, orange). Connect one lead to ground lug A of V-1. Solder the other lead to pin 9 of V-1 (2 wires).

☐ C-17, .05 μf disc capacitor. Solder one lead to ground lug C of V-1. (2 wires). Connect the other lead to terminal 3 of T-1.

☐ C-18, .01 μf disc capacitor. Connect one lead to terminal 2 of T-1. Solder the other lead to ground lug B of V-2 (2 wires).

☐ C-19, .005 μf disc capacitor. Thread one lead through pin 7 of V-2 and connect to ground lug D. Solder pin 7. Connect the other lead to pin 6.

☐ Are you trimming the leads of the capacitors as you install them? Use only as much of the lead as you require to connect the component between the terminals — cut off the excess length.

☐ C-20, .01 μf disc capacitor. Solder one lead to ground lug D of V-2 (2 wires). Connect the other lead to terminal 3 of T-2.

☐ C-21, .01 μf disc capacitor. Connect one lead to terminal 2 of T-2. Solder the other lead to ground lug B of V-3 (3 wires).

☐ C-22, .005 μf disc capacitor. Thread one lead through pin 7 of V-3 and solder to ground lug D (2 wires). Solder pin 7. Connect the other lead to pin 6.

☐ C-25, 3300 pf (may be marked .0033) disc capacitor. Connect one lead to ground lug C of V-3. Connect the other lead to terminal 11 of TS-1.

☐ C-24, 100 pf disc capacitor. Solder one lead to ground lug B of V-4. Connect the other lead to terminal 2 of T-3.

☐ C-26, .005 μf disc capacitor. Connect one lead to terminal 8 of TS-1. Solder the other lead to terminal 9 of TS-1 (2 wires).

☐ Remember to wipe the tip of your soldering iron frequently. A clean soldering iron is essential to good soldering.

☐ C-55, 30 pf mica capacitor. Solder one lead to the center terminal of V-9 (3 wires). Connect the other lead to pin 1 of V-9.

☐ C-52, .005 μf disc capacitor. Connect one lead to ground lug D of V-9. Connect the other lead to terminal 2 of L-4.

☐ C-51, 68 pf silver mica capacitor. Connect one lead to terminal 1 of L-4. Connect the other lead to pin 2 of V-8.

☐ C-48, .001 μf disc capacitor. Connect one lead to terminal 1 of L-5. Connect the other lead to the solder lug.

☐ C-43, .001 μf disc capacitor. Connect one lead to pin 2 of V-7. Connect the other lead to the solder lug.

☐ C-45, 2200 pf disc capacitor (may be marked .0022). Solder one lead to pin 1 of V-7 (2 wires). Solder the other lead to the solder lug (3 wires).

☐ C-46, 2200 pf disc capacitor. Connect one lead to pin 4 of V-7. Solder the other lead to the solder lug (3 wires).

☐ C-35, .05 μf disc capacitor. Connect one lead to terminal 3 of TS-6. Solder the other lead to terminal 5 of TS-6.

☐ C-38, 220 pf disc capacitor. Connect one lead to pin 2 of V-6. Connect the other lead to pin 3 of V-6.

☐ C-63, .001 μf disc capacitor. Solder one lead to ground lug D of V-6. Connect the other lead to pin 8 of V-6.

☐ C-32, 5 μf electrolytic capacitor. Connect the lead from the end marked + to pin 8 of V-6. Connect the other lead to ground lug A of V-6.

☐ C-62, .01 μf disc capacitor. Solder one lead to pin 5 of V-6 (2 wires). Connect the other lead to the ground post near V-6.

☐ R-29, 470K resistor (yellow, violet, yellow). Slip 1" of tubing over each lead. Solder one lead to terminal 2 of R-30. Connect the other lead to pin 7 of V-6.

☐ R-45, 22 ohm, 1-watt resistor (red, red, black). Connect one lead to terminal 1 of TS-7. Solder the other lead to terminal 4 of TS-7 (3 wires).

☐ Now is a good time to stop and check your work:

1. Do all solder connections have a shiny metallic finish? If not, the connection should be reheated — add a little solder if necessary.

2. Does the solder hold each wire tightly in a connection? If a wire can be moved in a solder connection, that connection must be reheated and a little solder added.

3. Has any solder run down a terminal to touch the chassis, or has too much solder on a connection let solder run between two terminals? If so, heat the connection with your soldering iron to draw away the excess solder.

May we suggest another rest? Set your kit aside and continue on again tomorrow.

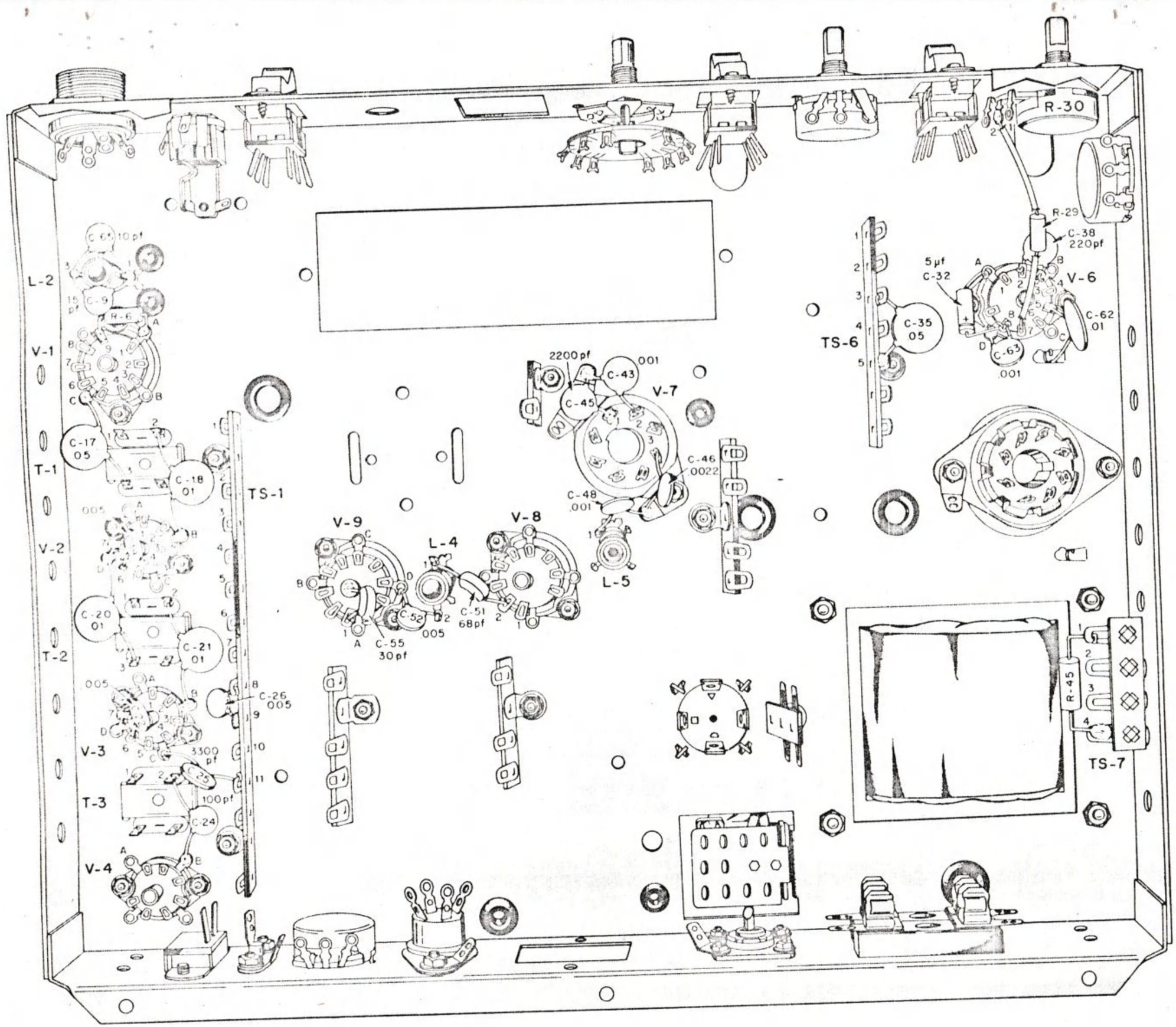

R-30
R-29
C-38
220pf
5µf
C-32
V-6
C-62
01
C-63
.001
C-35
05
TS-6
2200pf
C-43
001
C-45
V-7
C-46
.0022
C-48
.001
V-9
L-4
V-8
L-5
C-52
005
C-51
68pf
C-55
30pf
C-10
10pf
L-2
C-9
15pf
R-6
V-1
C-17
05
T-1
C-18
01
TS-1
V-2
C-20
01
C-21
01
T-2
C-26
005
V-3
3300
pf
T-3
100pf
C-24
V-4
R-45
TS-7

FIGURE 12

EIGHTH WIRING ON THE BOTTOM OF THE CHASSIS

SEE FIGURE 13.

☐ R-8, 470K resistor (yellow, violet, yellow). Solder one lead to ground lug B of V-1 (2 wires). Connect the other lead to pin 2 of V-1.

☐ C-16, .005 μf disc capacitor and R-11, 390K resistor (orange, white, yellow). Solder C-16 across R-11 as shown in the detail. Slip ½" of tubing over one lead of this combination and solder to pin 3 of V-1. Connect the other lead to terminal 3 of T-1.

☐ R-13, 1 meg resistor (brown, black, green). Solder one lead to terminal 2 of T-1 (3 wires). Solder the other lead to terminal 1 of TS-1 (2 wires).

☐ R-12, 1.5K resistor (brown, green, red). Slip ½" of tubing over one lead and solder to terminal 3 of T-1 (3 wires). Connect the other lead to terminal 2 of TS-1.

☐ R-54, 39K resistor (orange, white, orange). Connect one lead to terminal 2 of TS-1. Connect the other lead to terminal 4 of TS-1.

☐ R-24, 1 meg resistor (brown, black, green). Slip ¾" of tubing over each lead. Connect one lead to terminal 6 of TS-1. Solder the other lead to terminal 10 of TS-1 (3 wires).

☐ R-16, 1 meg resistor (brown, black, green). Solder one lead to terminal 2 of T-2 (3 wires). Solder the other lead to terminal 6 of TS-1 (3 wires).

☐ R-15, 1.5K resistor (brown, green, red). Slip ½" of tubing over one lead and connect it to terminal 3 of T-2. Solder the other lead to terminal 7 of TS-1 (4 wires).

☐ R-19, 47K resistor (yellow, violet, orange). Solder one lead to terminal 2 of T-3 (2 wires). Connect the other lead to terminal 11 of TS-1.

☐ R-18, 1.5K resistor (brown, green, red). Slip ½" of tubing over one lead and connect it to terminal 3 of T-3. Solder the other lead to terminal 12 of TS-1 (2 wires).

☐ R-23, 1 meg resistor (brown, black, green). Solder one lead to ground lug A of V-4. Solder the other lead to pin 2 of V-4 (3 wires).

☐ R-20, 27K resistor (red, violet, orange). Slip one lead through terminal 2 of S-1, through ½" of tubing and solder to pin 5 of V-4. Slip ¾" of tubing over the other lead and connect it to terminal 11 of TS-1.

☐ R-44, 47K resistor (yellow, violet, orange). Solder one lead to ground lug D of V-9 (2 wires). Connect the other lead to pin 2 of V-9.

☐ R-42, 68K resistor (blue, gray, orange). Solder one lead to the center terminal of V-8 (2 wires). Solder the other lead to pin 2 of V-8 (2 wires).

☐ R-57, 56 Ω 1-watt resistor (green, blue, black). Solder one lead to pin 5 of V-8 (2 wires). Solder the other lead to ground lug C of V-9 (2 wires).

☐ R-40, 100K resistor (brown, black, yellow). Solder one lead to ground lug C of V-8 (2 wires). Solder the other lead to terminal 1 of L-5 (2 wires).

☐ R-39, 68 Ω resistor (blue, gray, black). Solder one lead to pin 4 of V-7 (3 wires). Solder the other lead to terminal 1 of TS-4 (4 wires).

☐ Are you keeping the leads of the resistors as short as possible? Remember, excessive lead length can reduce the efficiency of your transceiver.

☐ R-34, 390K resistor (orange, white, yellow). Solder one lead to terminal 2 of TS-6 (3 wires). Connect the other lead to terminal 3 of TS-6.

☐ R-37, 330K resistor (orange, orange, yellow). Solder one lead to ground lug A of V-6 (2 wires). Connect the other lead to pin 2 of V-6.

☐ Remember to keep the tip of your soldering iron clean and brightly coated with solder.

☐ R-36, 4.7K resistor (yellow, violet, red). Slip ½" of tubing over one lead and solder it to pin 3 of V-6 (4 wires). Connect the other lead to the ground post near V-6.

☐ R-28, 3.3K resistor (orange, orange, red). Solder one lead to pin 8 of V-6 (3 wires). Solder the other lead to the ground post near V-6 (4 wires). **Be sure all wires in this connection are covered by the solder.**

☐ R-26, 470K resistor (yellow, violet, yellow). Solder one lead to the solder lug mounted with V-5 (3 wires). Solder the other lead to pin 5 of V-5 (3 wires).

☐ C-66, .001 μf disc capacitor. Solder one lead to pin 4 of V-5 (2 wires). Connect the other lead to pin 3 of V-5.

☐ R-25, 330 ohms, 2-watt resistor (orange, orange, brown). If possible, position this resistor down under the electrolytic capacitor previously installed, but not touching it. Solder one lead to the ground post shown (4 wires). Solder the other lead to pin 8 of V-5 (3 wires). **Be sure the solder flows over all wires connected to the ground post.**

☐ R-46, 220 ohm, 1-watt resistor (red, red, brown). Solder one lead to terminal 1 of TS-7 (4 wires). Solder the other lead to terminal 3 of TS-7 (2 wires).

☐ Remember to turn the chassis over and shake out all the loose pieces of wire and solder, etc.

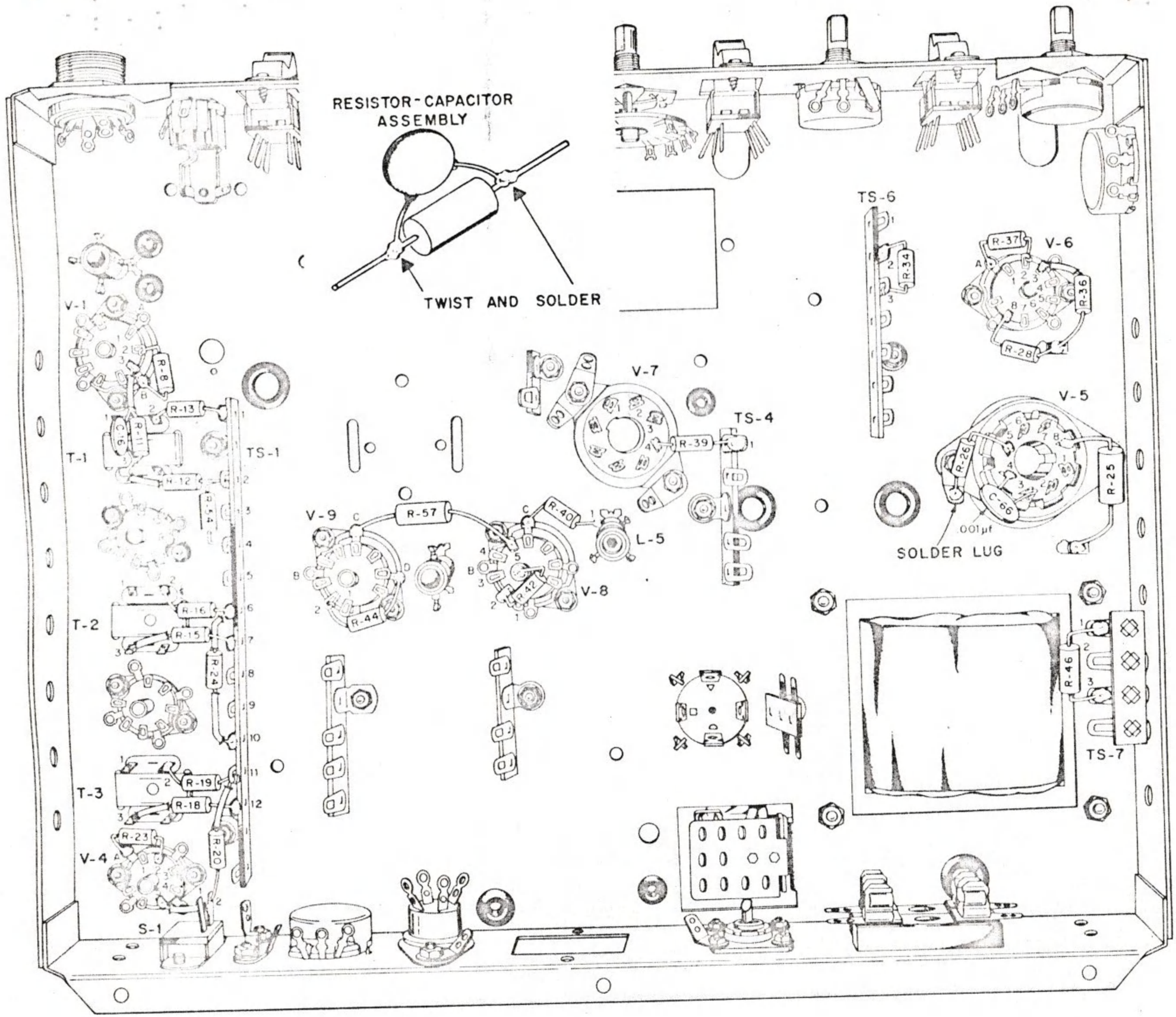

RESISTOR-CAPACITOR ASSEMBLY
TWIST AND SOLDER
V-1
R-8
R-13
R-11
C-6
T-1
TS-1
R-12
R-54
T-2
R-16
R-15
R-24
T-3
R-19
R-18
R-23
R-20
V-4
S-1
V-9
R-57
R-44
R-40
L-5
V-7
R-39
TS-4
V-8
R-42
TS-6
R-34
R-37
V-6
R-36
R-28
V-5
R-26
C-66
.001µf
SOLDER LUG
R-25
R-46
TS-7

FIGURE 13

NINTH WIRING ON THE BOTTOM OF THE CHASSIS

SEE FIGURE 14.

☐ R-7, 68K resistor (blue, gray, orange). Slip 1" of tubing over each lead. Solder one lead to pin 1 of V-1 (2 wires). Solder the other lead to terminal 2 of TS-1 (4 wires).

☐ R-52, 47 ohm resistor (yellow, violet, black). Connect one lead to pin 4 of V-2. Connect the other lead to terminal 3 of TS-1.

☐ R-58, 68 Ω 1-watt resistor (blue, gray, black). Solder one lead to pin 4 of V-2 (4 wires). Connect the other lead to terminal 5 or TS-1.

☐ R-14, 100K resistor (brown, black, yellow). Solder one lead to pin 6 of V-2 (2 wires). Solder the other lead terminal 3 of T-2 (3 wires).

☐ R-21, 470K resistor (yellow, violet, yellow). Solder one lead to ground lug C of V-3 (2 wires). Solder the other lead to terminal 11 of TS-1 (4 wires).

☐ R-17, 47K resistor (yellow, violet, orange). Solder one lead to pin 6 of V-3 (2 wires). Solder the other lead to terminal 3 of T-3 (3 wires).

☐ R-22, 27K resistor (red, violet, orange). Solder one lead to pin 7 of V-4 (2 wires). Solder the other lead to terminal 2 of S-1 (2 wires).

☐ R-5, 2.7K resistor (red, violet, red). Solder one lead to terminal 13 of TS-1 (3 wires). Solder the other lead to terminal 1 of R-2 (2 wires).

☐ R-51, 15K, 1-watt resistor (brown, green, orange). Connect one lead to terminal 1 of TS-2 .Solder the other lead to terminal 4 of TS-2 (2 wires).

☐ R-50, 250 ohm, 7-watt resistor. Solder one lead to terminal 1 of TS-2 (4 wires). Connect the other lead to terminal 1 of TS-3.

☐ R-47, 250 ohm, 7-watt resistor. Solder one lead to terminal 2 of TS-2 (3 wires). Solder the other lead to terminal 2 of TS-3 (2 wires).

☐ R-48, 1K, 7-watt resistor. Connect one lead to terminal 3 of TS-2. Solder the other lead to terminal 3 of TS-3 (2 wires).

☐ R-43, 39K resistor (orange, white, orange). Solder one lead to pin 8 of V-9 (2 wires). Solder the other lead to terminal 2 of L-4 (3 wires).

☐ 1½" bare wire. Solder one end to pin 6 of V-9. Connect the other end to terminal 1 of L-4.

☐ R-55, 68 Ω resistor (blue, gray, black). Slip ¾" tubing over one lead and solder pin 3 of V-8 (2 wires). Solder the other lead to terminal 1 of TS-11 (2 wires).

☐ 1" bare wire and ⅝" tubing. Slip the tubing over the wire. Solder one one end to pin 5 of V-7. Solder the other end to terminal 2 of L-5.

☐ R-53, 68 ohm, 1-watt resistor (blue, gray, black). Solder one lead to pin 2 of V-7 (3 wires). Solder the other lead to pin 7 of V-7 (2 wires).

☐ R-38. 56K, 1-watt resistor (green, blue, orange). Solder one lead to pin 3 of V-7 (2 wires). Connect the other lead to terminal 2 of TS-4.

☐ CR-3 diode. Notice that one end is marked with a band, or by its bullet shape. These diodes must be wired in the circuit with the marked end as shown. Solder the lead from the marked end to terminal 2 of TS-5. Solder the other lead to ground lug A of C-60.

NOTE: If you have a 100 watt (or greater) soldering iron, solder one of the ground lugs of C-60 to the chassis.

☐ CR-2 diode. Solder the lead from the marked end to terminal 1 of TS-5 (2 wires). Solder the other lead to terminal 2 of TS-5 (2 wires).

☐ R-10, 47K, 2-watt resistor (yellow, violet, orange). Solder one lead to terminal 1 of TS-6 (3 wires). Connect the other lead to terminal 4 of TS-6.

☐ R-35, 150K resistor (brown, green, yellow). Solder one lead to pin 1 of V-6 (2 wires). Solder the other lead to terminal 3 of TS-6 (3 wires).

☐ R-27, 220K resistor (red, red, yellow). Slip 1" of tubing over one lead and solder it to pin 6 of V-6 (2 wires). Connect the other lead to terminal 4 of TS-6.

☐ R-31, 470K resistor (yellow, violet, yellow). Slip ¾" of tubing over each lead. Solder one lead to pin 7 of V-6 (2 wires). Solder the other lead to terminal 2 of R-32.

☐ R-49, 1K, 7-watt resistor. Solder one lead to terminal 4 of TS-6 (3 wires). Solder the other lead to terminal 7 of TS-6 (4 wires).

Before you go on, check the following:

☐ Are the diodes wired into the circuit correctly—the marked ends away from the inside bottom of the chassis?

☐ There are a number of terminals and pins with 3 or more wires connected to them. Are all the wires in the soldered connections covered with solder? Reheat any connection in which all wires are not covered with solder; if necessary, add a little solder when you reheat the connection.

☐ Are all leads kept as short as possible? Clip off all excess wire ends.

☐ Bend the terminals of R-2 slightly downward to be sure they will not touch the case bottom when the unit is installed in the case.

☐ Some of the wiring is very close, especially around V-1, 2, 3 and 4. Check to be sure no solder has bridged across or between terminals or pins. Be sure no pins are touching and no bare leads touch nearby terminals, pins or the chassis.

Always check for possible problem areas at the end of each wiring sequence. Remember that a little time spent now can save much time later on checking and rechecking the completed unit.

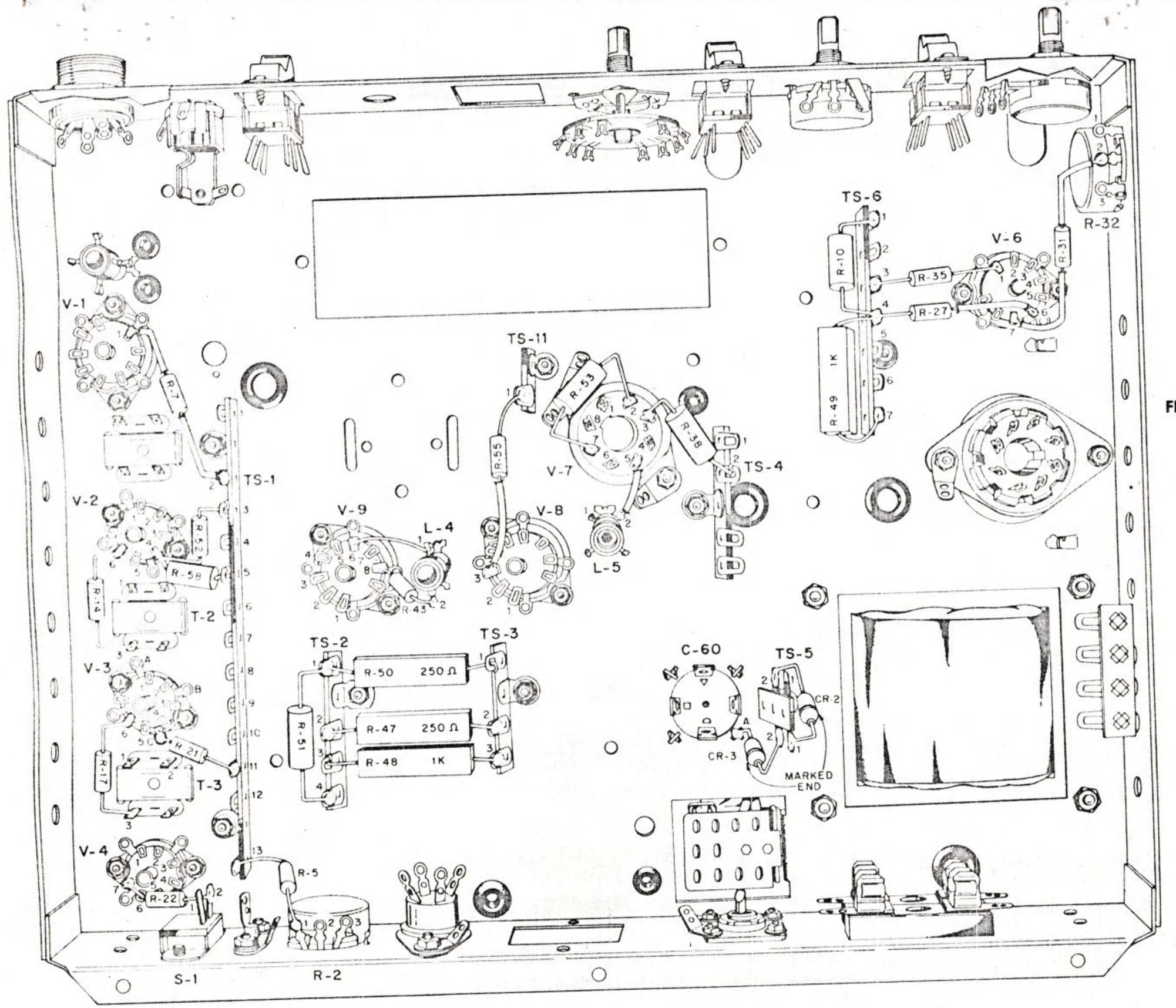

TS-6
R-32
V-6
R-10
R-35
R-27
R-31
R-49
1K
V-1
R-7
TS-1
TS-11
R-53
R-38
R-55
V-7
TS-4
V-2
R-52
R-58
R-14
T-2
V-9
L-4
R-43
V-8
L-5
TS-2
TS-3
R-50 250Ω
R-47 250Ω
R-48 1K
R-51
C-60
TS-5
CR-2
CR-3
MARKED END
V-3
R-21
R-17
T-3
V-4
R-22
R-5
S-1
R-2

FIGURE 14

TENTH WIRING ON THE BOTTOM OF THE CHASSIS

SEE FIGURE 15.

NOTE: Two types of cable are supplied in your kit. When shielded cable is called for, use the thin gray cable. When coaxial cable is called for, use the heavy black cable.

☐ 9¾" shielded cable. Clip off the shield wire from one end. Prepare the other end as shown in Figure 16.

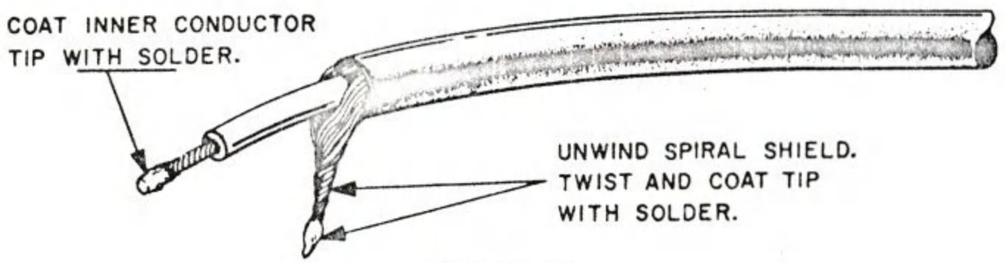


FIGURE 16

☐ At the end of the cable without the shield, connect the inner conductor to terminal 6 of S-4. Route the other end as shown and solder the inner conductor to pin 2 of V-9 (2 wires). Connect the shield to ground lug B of V-9. **Caution: Do not overheat solder connections for shielded cables; use only enough heat to solder the wire end.**

NOTE: Do not let the shield wires, of any of the strands of the shield, touch either the inner conductors or nearby terminals.

☐ 16½" shielded cable. Clip off the shield wire from one end. Prepare the other end as shown in Figure 16.

☐ At the end of the cable with the shield, solder the shield to terminal 3 of R-30 (2 wires). Be sure to solder the solder lug along with these wires. Solder the inner conductor to terminal 1 of R-30. Route as shown and solder the inner conductor to terminal 8 of TS-1 (2 wires).

☐ 9¾" shielded cable. Prepare both ends as shown in Figure 16.

☐ At one end of the cable, slip ¾" of tubing over the shield and connect it to terminal 5 of S-4. Solder the inner conductor to terminal 1 of S-4. Route the other end as shown and solder the shield to ground lug B of V-9 (3 wires). Connect the inner conductor to pin 1 of V-9.

☐ 13½" shielded cable. Prepare the ends as shown in Figure 16. Cut off the shield on one end.

☐ At the end of the cable without the shield, solder the inner conductor to terminal 10 of S-4. Route the other end as shown and connect the shield to terminal 2 of J-7. Solder the inner conductor to terminal 1 of J-7.

☐ Coaxial cable. Cut to 9¼" long. Prepare as shown in Figure 17.

☐ Insert the end with the shorter shield through the hole near K-1. Solder the inner conductor to terminal 8 of K-1. Connect the shield to the solder lug.

☐ Use the lacing twine supplied to tie the cables to the harness. This will keep the cables in place and will improve the appearance of the completed unit.

☐ C-53, MULT variable capacitor. Mount with two 4-40 x ¼" screws.

☐ Red wire. Solder one end to terminal 2 of C-53. Solder the other end to terminal 1 of L-4 (3 wires).

☐ C-58, 30 μf electrolytic capacitor. Solder the lead from the end marked with a + to terminal 1 of TS-5. Solder the other lead to terminal 1 of TS-3 (3 wires).

☐ C-59, 10 μf electrolytic capacitor. Slip ¾" of tubing over the lead from the end marked with a + and solder it to terminal 3 of TS-2 (3 wires). Solder the other lead to terminal 2 of J-7 (2 wires).

☐ Gray wire. Solder one end to terminal 3 of TS-1 (2 wires). Insert the other end down through the grommet shown; it will be connected later.

☐ Orange wire. Connect one end to terminal 2 of TS-4. Insert the other end down through the grommet shown; it will be connected later.

☐ Check to be sure no strands of the shielded cables are touching terminals, leads or the chassis. Check this very carefully.

☐ How about another rest before you turn the unit over and continue on the top of the chassis? At least take time to relax and stretch a little. A tired builder is more likely to make mistakes.

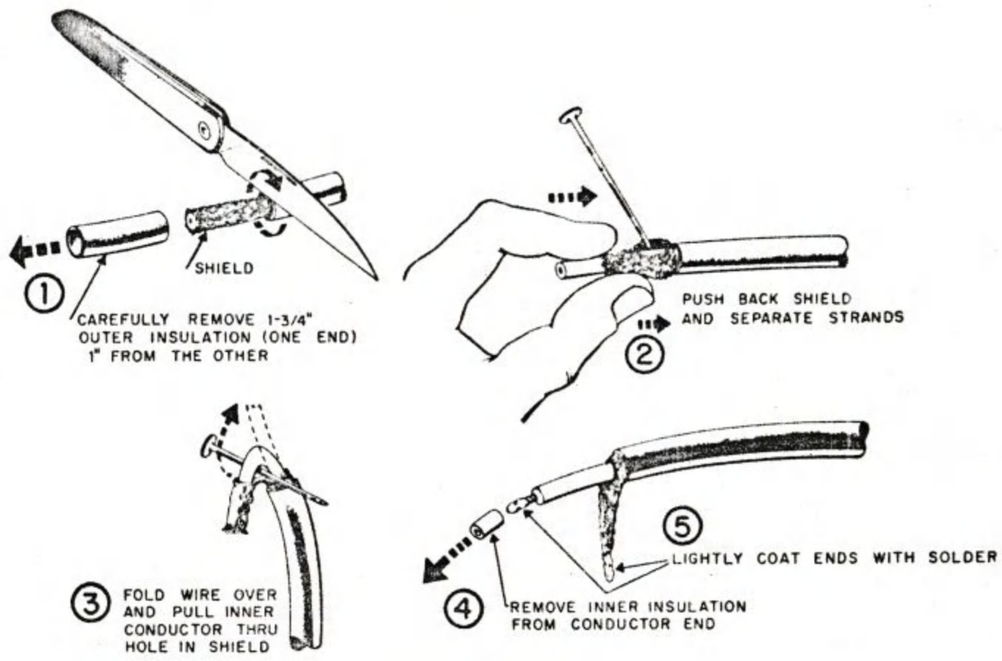


FIGURE 17

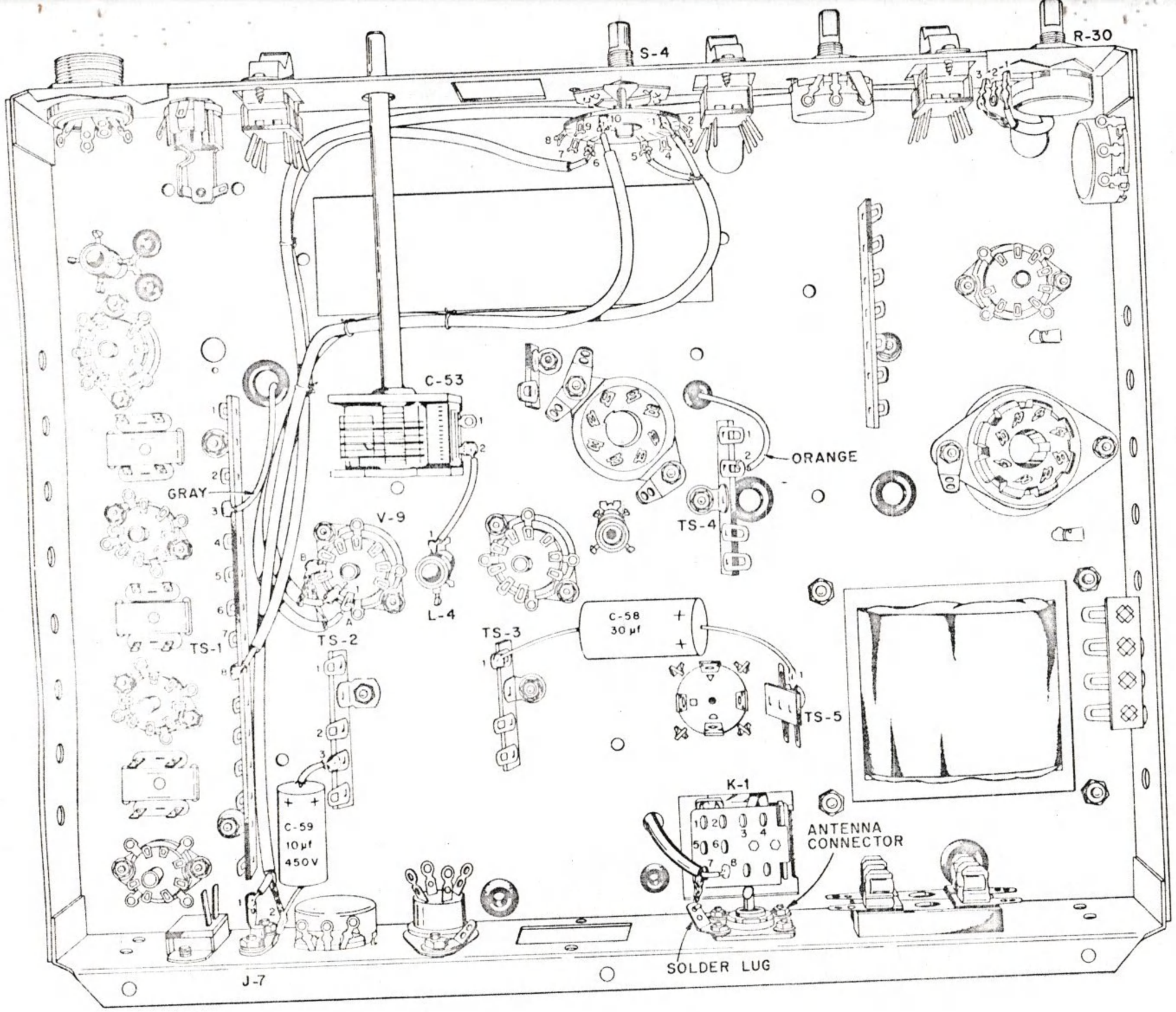

S-4
R-30
C-53
GRAY
V-9
ORANGE
TS-4
L-4
TS-1
TS-2
TS-3
C-58
30 µf
TS-5
K-1
C-59
10µf
450V
ANTENNA
CONNECTOR
J-7
SOLDER LUG

FIGURE 15

MOUNTING PARTS ON THE TOP OF THE CHASSIS

SEE FIGURE 18.

☐ Speaker, two medium grommets, two eyelets, and two flatwashers. Assemble as shown. Fasten with two 6-32x½" screws, lockwashers and nuts.

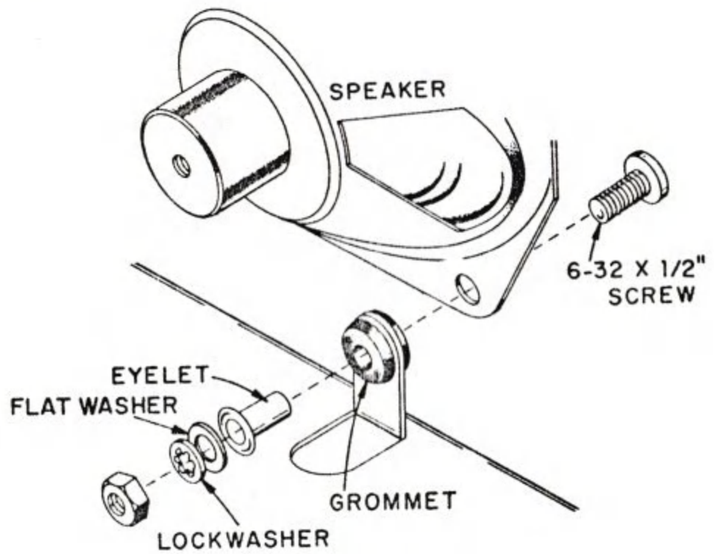


FIGURE 18

SEE FIGURE 19.

☐ C-39 and C-40. Mount on the capacitor support bracket, as shown. Fasten each with a heavy ⅜" lockwasher and nut.

☐ Mount the capacitor support bracket on the capacitor adapter bracket. Fasten with two 4-40x¼" screws, lockwashers and nuts. Do not tighten.

SEE FIGURE 20.

NOTE: The 6-32x3/16" screws are the shortest in the kit.

☐ C-8, tuning capacitor, and tuning capacitor bracket. Mount the capacitor on the bracket. Fasten with three 6-32x3/16" screws and six #6 lockwashers. Use two lockwashers under the head of each screw.

CAUTION: Turn the capacitor through its entire range, to be sure the rotor does not rub on the mounting screws.

☐ Slip the tuning dial and bushing over the capacitor shaft. Thread a setscrew through the bushing. Position the bushing about ¼" away from the capacitor bracket and tighten the setscrew.

☐ C-12, 68 pf mica capacitor. Slip ½" of tubing over one lead and solder to terminal 2 of the tuning capacitor. Position the body of C-12 under the tuning capacitor.

SEE FIGURE 21.

☐ Tuning capacitor assembly. Mount on the chassis, where shown. Fasten with two 6-32x¼" screws, lockwashers and nuts. Tighten securely.

☐ L-1, coil. This coil may be identified by Part #142-148, or brown, yellow, and gray color dots. Snap into the chassis. Be sure to engage the locating tab in the locating hole.

☐ C-12, 68 pf mica capacitor, connected to terminal 2 of the tuning capacitor. Connect the free lead to terminal 2 of L-1.

☐ C-39/C-40 assembly and TS-12, 2-terminal strip. Position the capacitor assembly on the top of the chassis. Fasten with two 6-32x¼" screws, lockwashers and nuts. Mount TS-12 on the under side of the chassis, on the screw closer to the speaker. Position TS-12 as shown in Figure 25.

☐ Long ceramic spacer. Remove the mounting screw from TS-11, mounted on the bottom of the chassis. Mount the ceramic spacer on top of the chassis with this same screw.

☐ Short ceramic spacer. Mount with a 6-32x3/16" screw and a solder lug. Place the solder lug between the chassis and spacer.

☐ Two #6 solder lugs. Mount one on top of each spacer, positioned as shown. Fasten each with a 6-32x¼" screw.

☐ TS-9, 5-terminal strip. Mount with a 6-32x¼" screw, two lockwashers and a nut.

☐ TS-10, 4-terminal strip. Mount with a 6-32x¼" screw, two lockwashers and a nut.

☐ TS-8, 3-terminal strip. Mount on the speaker. Fasten with a 6-32x¼" screw, two lockwashers and a nut.

☐ Coaxial cable, from hole near relay. Route as shown. Solder the shield to the long terminal of C-39. Connect the inner conductor to terminal 1 of TS-9.

☐ Converter sub-assembly. Position as shown. Mount with two #6 lockwashers and nuts. Push the thin shielded cable down, through the grommet.

CAUTION: Before mounting the transistor sockets, carefully feel around the mounting holes for slight burrs that might remain from the punching operation. If there are any, remove them with your small screwdriver or knife. Burrs that are allowed to remain may pierce the transistor insulators and cause short circuits.

☐ Back plate and two transistor sockets. Position the sockets as shown, with the B markings toward the left. Check the holes for alignment. If they do not, turn the back plate over. When the holes are properly aligned, mount each socket with two 6-32x⅜" FILLISTER-HEAD screws, lockwashers and nuts. FILLISTER-HEAD SCREWS must be used to mount these sockets. If regular screws are used the power transistors will short circuit to the chassis.

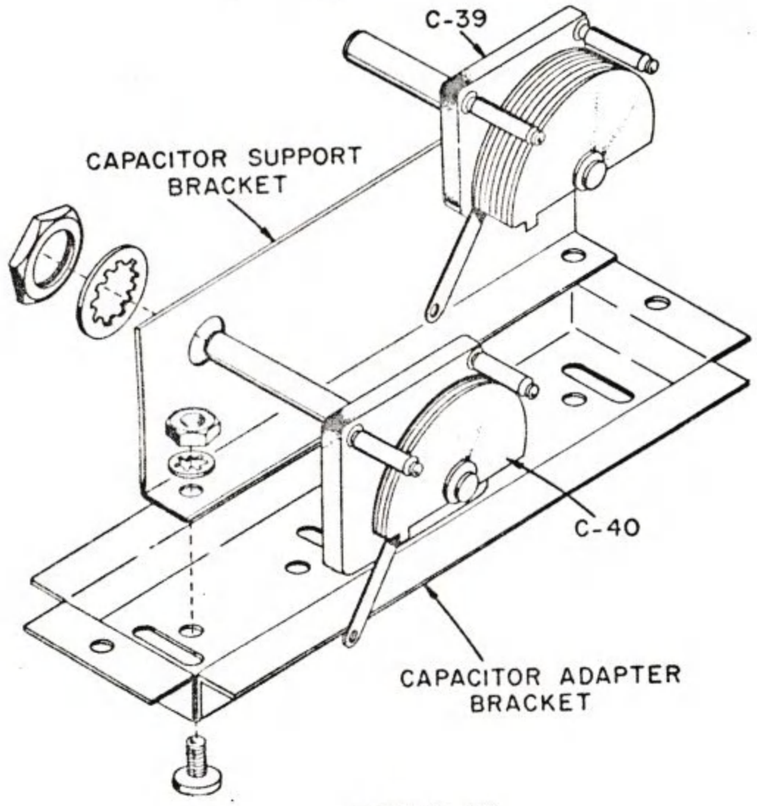


FIGURE 19

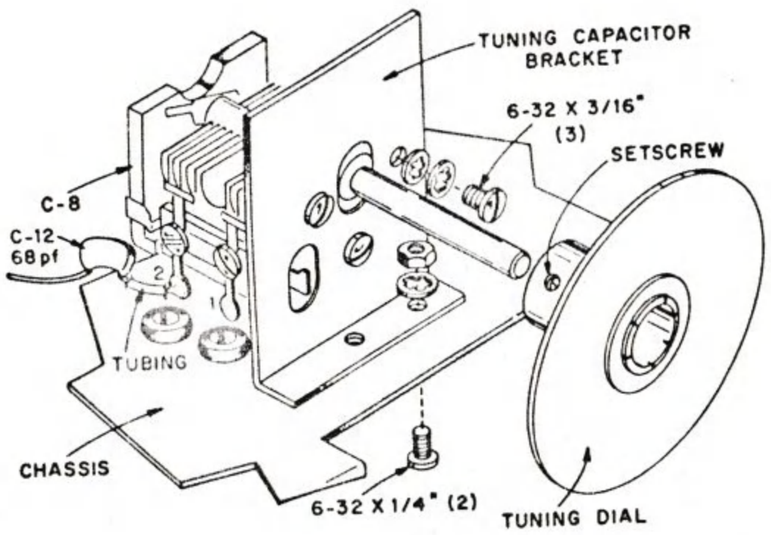


FIGURE 20

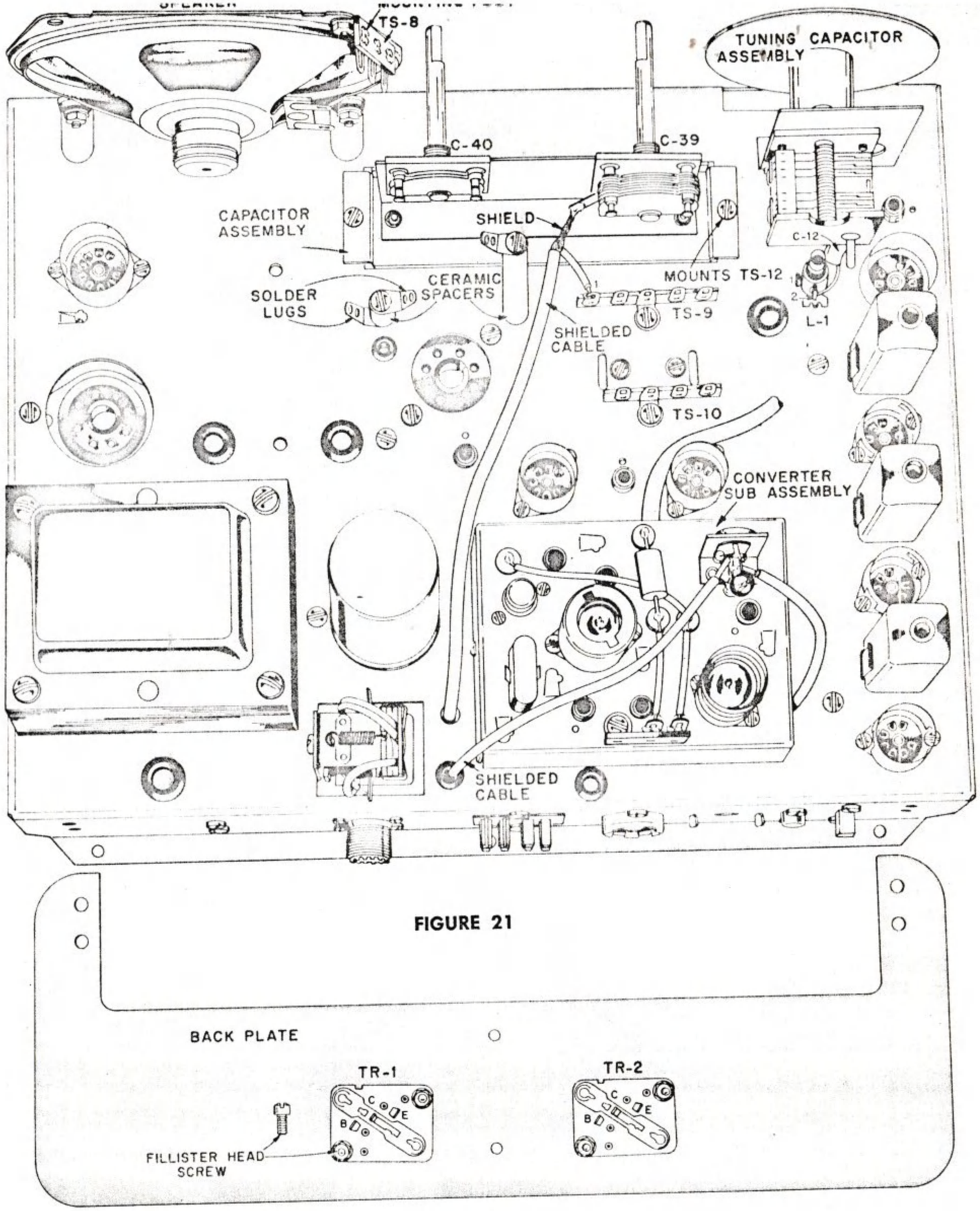


FIGURE 21

FIRST WIRING ON THE TOP OF THE CHASSIS

SEE FIGURE 22.

☐ Blue wire extending up through the cut-out below the speaker. Connect the free end to terminal 3 of TS-8.

☐ R-33, 220K resistor (red, red, yellow). Solder one lead to terminal 3 of TS-8 (2 wires). Connect the other end to terminal 2 of TS-8.

☐ Orange wire coming up through the grommet near the ceramic spacers. Connect the free end to the solder lug on top of the short ceramic spacer.

☐ C-42, .001 μf, 2KV disc capacitor. Solder one lead to the solder lug under the short ceramic spacer. Connect the other lead to the solder lug mounted on top of this spacer.

☐ RFC-1. This part looks like a coil of wire wound on a resistor-shaped form. Solder one lead to the solder lug mounted on the top of the left spacer (3 wires). Connect the other lead to the solder lug on top of the long spacer.

☐ C-41, 750 pf mica capacitor. Connect one lead to the solder lug, mounted on the long spacer. Connect the other lead to terminal 2 of C-40.

☐ L-3, 1-turn coil. Position the loop of the coil away from the chassis. Solder one end to terminal 2 of C-40 (2 wires). Connect the other end to terminal 1 of C-39.

☐ 1½" bare wire. Solder one end to terminal 1 of C-39 (2 wires). Connect the other end to terminal 1 of TS-9.

☐ C-2, 3.3 pf disc capacitor. Solder one lead to terminal 1 of TS-9. (3 wires). Connect the other lead to terminal 1 of TS-10.

☐ C-1, .001 μf disc capacitor. Connect one lead to terminal 2 of TS-9. Connect the other lead to terminal 3 of TS-9.

☐ C-4, .005 μf disc capacitor. Solder one lead to terminal 3 of TS-9 (2 wires). Connect the other lead to terminal 4 of TS-9.

☐ Orange wire coming up through the grommet near TS-9. Connect to terminal 4 of TS-9.

☐ Blue wire coming up through the same grommet. Connect to terminal 3 of TS-10.

☐ White/orange wire coming up through the same grommet. Connect to terminal 4 of TS-10.

☐ R-3, 1K resistor (brown, black, red). Connect one lead to terminal 1 of TS-10. Connect the other lead to terminal 3 of TS-10.

☐ Pilot lamp and socket. Insert the pilot lamp into the socket. Slip the pilot lamp shield over the lamp and snap the socket onto the capacitor mounting bracket as shown. Position the shield so it will direct light toward the dial. If the shield does not fit tightly, press its sides together to assure a snug fit. Insert the wire down through the grommet shown.

☐ Bare wire and tubing, coming up through the grommet nearest the front of the chassis, next to C-8. Solder to terminal 1 of C-8.

☐ C-13, .005 μf disc capacitor. Connect one lead to terminal 1 of L-1. Connect the other lead to the ground lug on the rear of the tuning capacitor.

☐ C-14, .001 μf disc capacitor. Slip ¾" of tubing over one lead and connect to terminal 2 of L-1. Slip 1½" of tubing over the other lead. Push this lead down, through the grommet under terminal 2 of tuning capacitor, to be connected later. Position the capacitor body under the tuning capacitor.

☐ Heavy shielded cable, from converter assembly. Route as shown. Solder the inner conductor to terminal 2 of L-1 (3 wires). Solder the shield to the ground lug on the rear of the tuning capacitor.

☐ Violet wire coming up through the cut-out around the relay. Solder to terminal 11 of the relay.

☐ White/orange wire coming up through the grommet just behind the converter sub-assembly. Solder to terminal 1 of the sub-assembly.

☐ White/brown wire coming up through the same grommet. Solder to terminal 2 of the sub-assembly.

Wire the transistor sockets mounted on the back plate as follows, using the wires that come out of the grommet at the left rear of the chassis:

☐ Violet wire (from power transformer). Solder to terminal B of TR-1.

☐ Yellow wire (from harness). Solder to terminal Cof TR-1.

☐ Two red wires (from harness). Solder to terminal E of TR-1 (2 wires).

☐ Slate wire (from power transformer). Solder to terminal B of TR-2.

☐ Blue wire (from harness). Solder to terminal C of TR-2.

☐ Red wire (from harness). Solder to terminal E of TR-2.

SEE FIGURE 23.

☐ Transistors TR-1 and TR-2. Slip an insulator over the pins of the transistor and mount to the back plate (heat sink) with four #6 x ½" self-tapping screws as shown in Figure 22. Tighten these screws securely; they provide an electrical contact for the transistors.

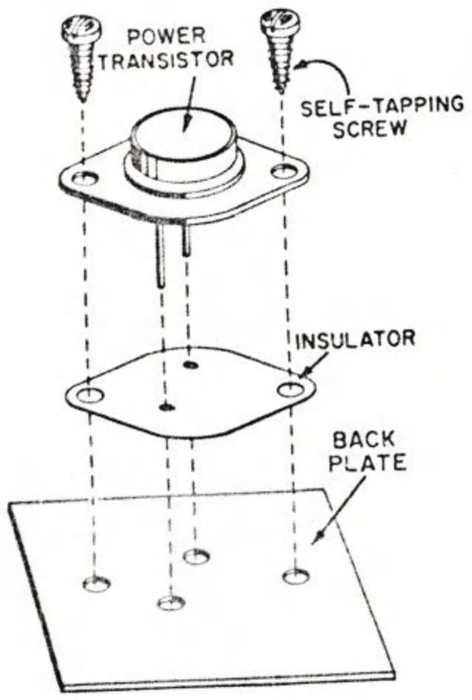


FIGURE 23

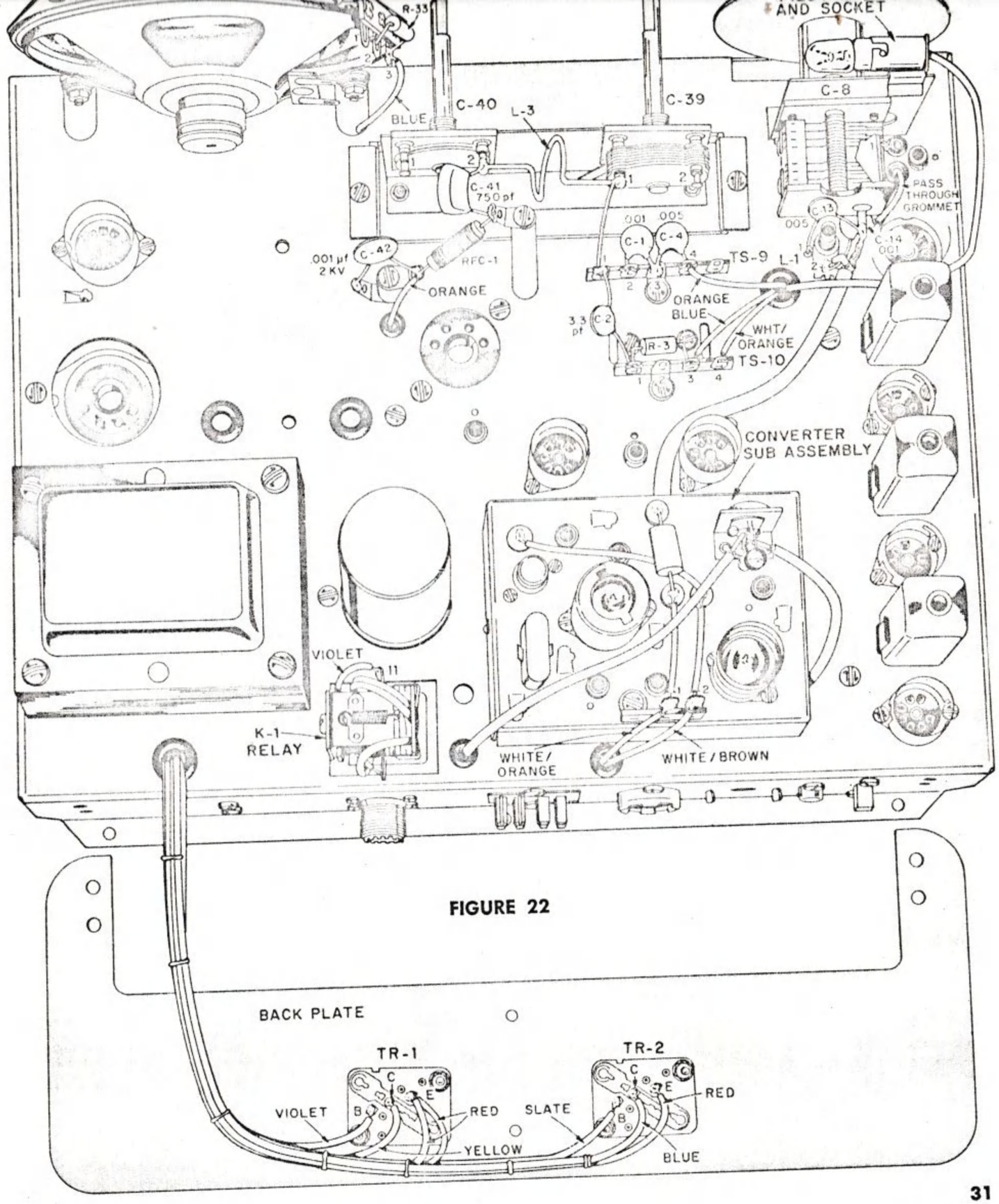


FIGURE 22

FINAL WIRING ON THE TOP OF THE CHASSIS

SEE FIGURE 24.

☐ Front panel and dial window. Remove the protective paper from the dial window before mounting. Position the engraved side toward the rear. Mount the dial window on the back of the front panel with a bushing and flat washer. Fasten from the rear of the panel with a small-tooth lockwasher and knurled nut. Square up the dial window with the edges of the panel.

☐ Center the shafts from C-39 and C-40 in their holes. Refer back to Figure 19 and tighten the capacitor bracket mounting screws securely.

☐ Meter and grounding clip. Mount the meter from the front of the panel. Place the grounding clip over the upper mounting screws, raised side away from the panel. Fasten with the hardware supplied.

☐ Transmit lamp. Mount from the front of the panel in the hole labeled TRANSMIT. Fasten from the back of the panel with the clip supplied.

☐ Six jacks for the crystals. Mount from the front of the panel in the holes labeled 1, 2 and 3. Fasten with ¼" lockwashers and nuts.

☐ Mount a bushing in the hole in the front panel labeled MULT. Place a flat washer over the bushing, then insert it through the hole from the front side of the panel. Fasten with a thin ⅜" lockwasher and a nut.

☐ Remove the knurled nut from the mic connector.

☐ Mount the front panel to the chassis with four flat washers, a knurled nut and three hex nuts. Also, thread the knurled nut from the microphone connector over the mic connector. Use the knurled ⅜" nut for the PHONES jack.

NOTE: If the switches and control shafts do not fit easily into the holes provided in the front panel, loosen the control mounting nuts slightly and the switch mounting screws, to achieve a proper fit; then retighten the nuts. Also, you may have to line up a flat side of the crystal jack mounting nuts to fit flat against the chassis cut-out.

☐ Black wire from cut-out below the speaker. Solder to terminal 2 of the speaker.

☐ Yellow wire. Connect one end to terminal 1 of the speaker. Insert the other end down through the cut-out; it will be connected later.

☐ 1½" bare wire. Solder one end to terminal 1 of the speaker (2 wires). Connect the other end to terminal 1 of TS-8.

☐ Slip 1" tubing over one lead from the transmit lamp and solder it to terminal 2 of TS-8 (2 wires).

☐ Slip 1½" of tubing over the other lead from the transmit lamp and connect it to terminal 1 of TS-8.

☐ Orange wire. Solder one end to terminal 1 of TS-8. (3 wires). Solder the other lead to terminal 1 of the meter.

☐ Gray wire coming up through the grommet near TS-9. Solder to terminal 2 of the meter.

☐ Blue wire. Connect one end to terminal 3 of the meter. Connect the other end to terminal 5 of TS-9.

☐ Blue wire. Connect one end to terminal 4 of the meter. Connect the other end to terminal 4 of TS-10.

☐ C-5, .001 μf disc capacitor. Solder one lead to terminal 3 of the meter (2 wires). Solder the other end to terminal 4 of the meter (2 wires).

☐ CR-1 diode. **It has a marked end.** Carefully note which is the **banded** or marked end before you remove the diode from the card. Solder the lead from the marked end to terminal 1 of TS-10 (3 wires). Connect the other lead to terminal 2 of TS-9.

☐ R-1, 1K resistor (brown, black, red). Solder one lead to terminal 2 of TS-9 (4 wires). Solder the other lead to terminal 4 of TS-9 (3 wires).

☐ R-4, 6.8K resistor (blue, gray, red). Solder one lead to terminal 5 of TS-9 (2 wires). Connect the other lead to terminal 3 of TS-10.

☐ C-6, .01 μf disc capacitor. Connect one lead to terminal 2 of TS-10. Solder the other lead to terminal 3 of TS-10 (4 wires).

☐ C-7, .005 μf disc capacitor. Solder one lead to terminal 2 of TS-10 (3 wires). Solder the other lead to terminal 4 of TS-10 (3 wires).

☐ Orange wire. Solder one end to terminal 1 of L-1 (2 wires). Push the other end through the grommet, to be connected later.

☐ T-5, modulation transformer. Position the transformer as shown and insert the leads down through the grommets. Mount with two 6-32x¼" screws, lockwashers and nuts.

☐ V-7, 2E26 tube. Insert into V-7 socket. Snap the clip for the plate connection onto the top of the tube. Position it on the upper part of the plate connection.

☐ Shielded braid. Solder the ends of the braid to the two ends of the plate clip. Solder the center of the braid to the solder lug, mounted on the long spacer (3 wires).

NOTE: The braid should be kept just long enough so the clip can be removed if the tube needs replacement; no longer. This will assure maximum efficiency of the output stage.

☐ Mount the back plate to the rear of the chassis with four 6-32 x 5-16" screws, eight lockwashers and nuts. Place a lockwasher under the head of each screw, as well as under each nut.

☐ You have completed wiring the top of the chassis. Carefully inspect the following:

1. Are all connections soldered? They should be.
2. Does each solder connection have shiny, metallic finish? If not, reheat the connection and add a little solder if necessary.
3. Are there any short pieces of wire or "blobs" of solder touching between adjacent terminals or to the chassis? Remove any such material before going on.
4. Does the solder hold each wire tightly in a connection? If a wire can be moved in a connection, that connection must be reheated and a little solder added.

☐ How about another rest?

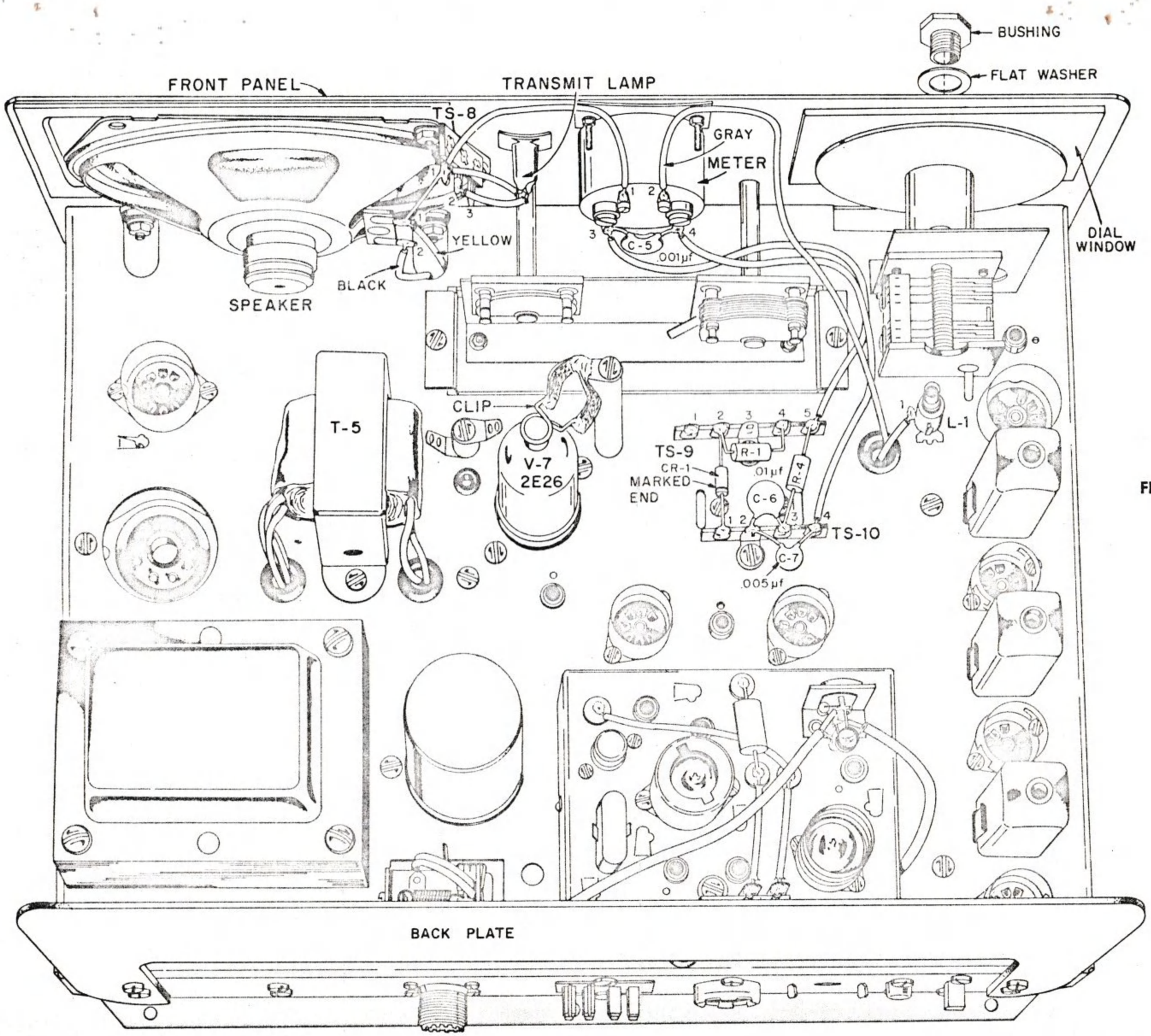

BUSHING
FLAT WASHER
FRONT PANEL
TRANSMIT LAMP
TS-8
GRAY
METER
DIAL WINDOW
YELLOW
BLACK
SPEAKER
C-5
.001µf
CLIP
T-5
V-7
2E26
TS-9
R-1
CR-1
MARKED END
.01µf
R-4
C-6
TS-10
C-7
.005µf
L-1
BACK PLATE

FIGURE 24

FINAL WIRING ON THE BOTTOM OF THE CHASSIS

SEE FIGURE 25.

☐ Turn the chassis over and finish wiring the bottom.

☐ Solder the capacitor assembly to the chassis at the point shown.

NOTE: For neater appearance, route the wires from the grommets under the wiring harness.

☐ Black wire from grommet near TS-1. Solder to terminal 5 of TS-1 (2 wires). Route this under all wires in this area; also trim in length as required.

☐ Orange wire from grommet near TS-1. Solder the free end to terminal 4 of TS-1 (2 wires).

☐ Bare wire and tubing, from grommet near V-1. Solder to pin 2 of V-1 (2 wires).

☐ 1½" bare wire. Thread through terminal 1, 3 and 5 of the crystal socket jacks. Solder terminal 1 and 3.

☐ 1" bare wire. Solder one end to terminal 7 of S-4. Solder the other to terminal 6 of the crystal socket jacks.

☐ 1" bare wire. Solder one end to terminal 8 of S-4. Solder the other end to terminal 4 of the crystal socket jacks.

☐ 1" bare wire. Solder one end to terminal 9 of S-4. Solder the other end to terminal 2 of the crystal socket jacks.

☐ Orange wire. Solder one end to terminal 5 of S-4 (2 wires). Solder the other end to terminal 5 of the crystal socket jacks (2 wires).

☐ C-56, 15 pf disc capacitor. Slip ½" of tubing over each lead. Solder one lead to terminal 4 of S-4 (2 wires). Solder the other lead to terminal 6 of S-4 (2 wires).

☐ Yellow wire from the cut-out below S-3. Connect to terminal 2 of TS-12.

☐ Red wire. Solder one end to terminal 1 of S-3. Solder the other end to terminal 2 of TS-12. (2 wires).

☐ R-56, 27K resistor (red, violet, orange). Solder one lead to terminal 4 of S-3. Connect the other lead to terminal 1 of TS-12.

☐ Orange wire, from harness. Solder to terminal 1 of TS-12 (2 wires).

☐ 13½" shielded cable. Prepare the ends as shown in Figure 16. At one end of the cable, solder the shield to terminal 4 of J-3. Solder the inner conductor to terminal 1 of J-3.

☐ Route the other end of this cable as shown — under the switches and controls. Solder the shield to ground lug B of V-6 (2 wires). Solder the inner conductor to pin 2 of V-6 (3 wires).

☐ Green wire from grommet near TS-4. Solder to terminal 3 of TS-4 (2 wires).

☐ Black wire from the same grommet. Route as shown and solder to terminal 1 of K-1.

☐ Yellow wire from grommet near V-5. Solder to terminal 2 of TS-4 (3 wires).

☐ Red wire from the same grommet. Connect to terminal 6 of TS-6.

☐ Red/white wire from the same grommet. Solder to terminal 6 of TS-6 (3 wires).

☐ Blue wire from the same grommet. Solder to pin 3 of V-5 (3 wires).

☐ Shielded cable coming up through the grommet near K-1. Solder the inner conductor to terminal 7 of K-1. Connect the shield to the solder lug.

☐ 2" bare wire and 1¼" tubing. Solder one end of the wire to terminal 3 of K-1. Slip the tubing over the wire and solder the other end to the solder lug mounted with the antenna connector (2 wires).

☐ RFC-2. Solder one lead to pin 1 of V-9 (3 wires). Solder the other lead to pin 4 of V-9 (2 wires).

☐ R-41, 15K resistor (brown, green, orange). Slip ¾" of tubing over each lead. Solder one lead to pin 9 of V-8 (2 wires). Solder the other lead to terminal 4 of TS-4 (2 wires).

You have completed all the wiring and soldering on the chassis of your transceiver. By now, all connections should be soldered. There are a number of things you should check before proceeding:

1. Check to be sure no short pieces of wire or loose pieces of solder are touching between adjacent terminals or to the chassis. Any such material must be removed before you connect power to the unit. Checks especially on and near tube sockets V-1, V-6, V-7, V-8 and V-9.
2. Does each solder connection have a shiny metallic finish? If not, reheat the connection and add a little solder if necessary.
3. Has any solder run down a terminal to touch the chassis, or has too much solder on a connection let solder run between terminals? Reheat any such connection with your soldering iron to draw away the excess solder.
4. Can you move wires in a soldered connection? This indicates a "cold" solder connection, which must be reheated and a little solder added.
5. Carefully check each shielded cable to be sure that no loose strands of the shield are touching nearby terminals, the chassis or the inner conductor. Also, check to see if the soldering heat caused the shield to melt through the insulation and touch the inner conductor.
6. Check to be sure all excess wire ends have been cut off.
7. Are all leads pressed down near the chassis? Remember, lead placement and length affects the efficiency of your transceiver. Shorten leads where necessary and press leads down near the chassis.
8. Lastly, go over the entire unit, checking each insulated wire to see if the insulation has been burned or melted through, allowing the bare wire to touch a terminal or another wire. Check for this problem especially where a wire might be pulled tightly against a terminal. Such a problem causes a "short-circuit," which may keep your unit from operating.

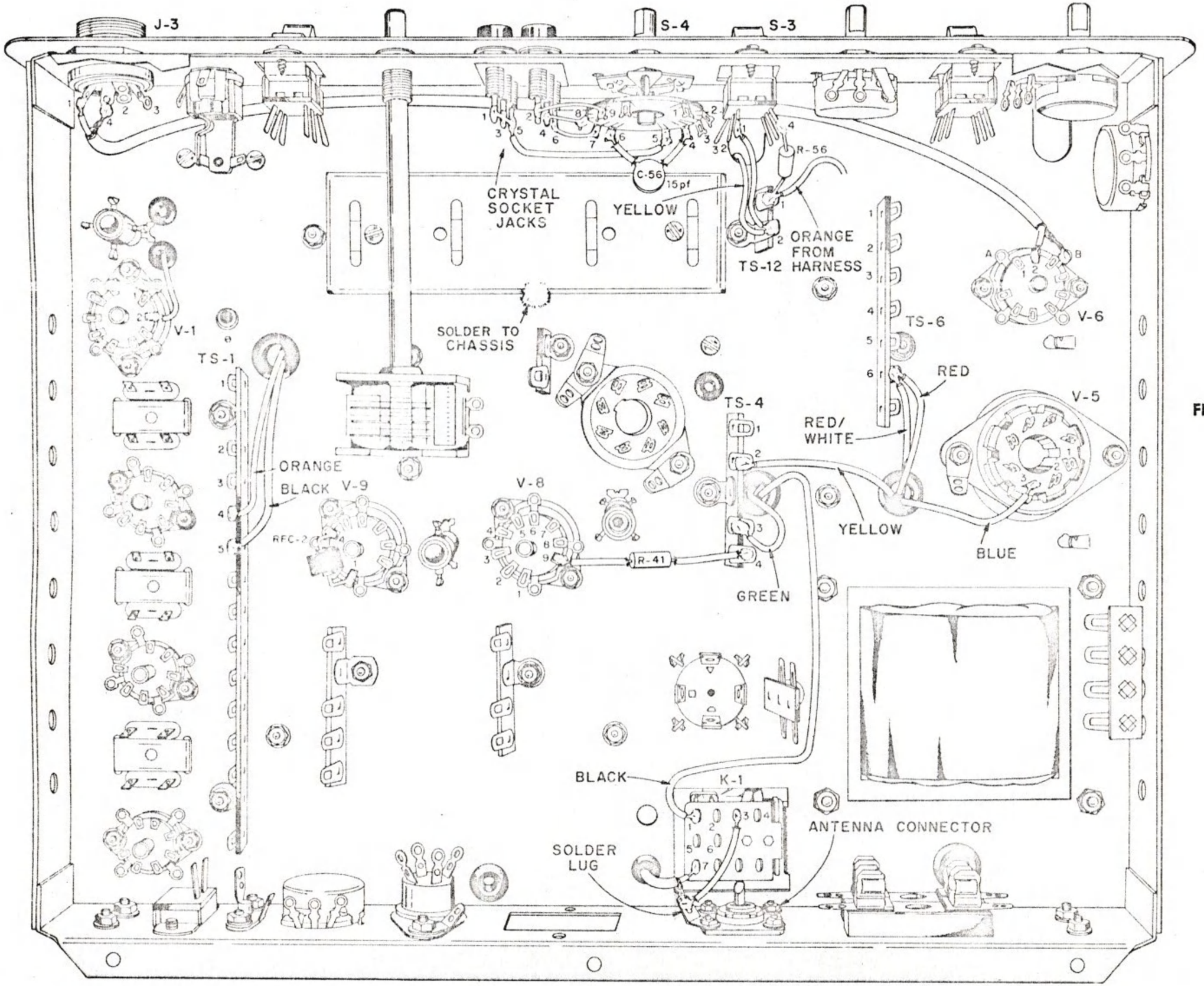

J-3
S-4
S-3
CRYSTAL SOCKET JACKS
C-56
15pf
YELLOW
R-56
ORANGE FROM TS-12 HARNESS
SOLDER TO CHASSIS
V-1
TS-1
V-6
TS-6
RED
V-5
TS-4
RED/ WHITE
ORANGE
BLACK V-9
V-8
R-41
YELLOW
BLUE
GREEN
BLACK
K-1
ANTENNA CONNECTOR
SOLDER LUG

FIGURE 25

INSTALLING THE TUBES

The tube numbers are stamped next to the sockets. Install as follows:

- ☐ V-1, 6EA8.
- ☐ V-2 and 3, 6BZ6.
- ☐ V-4, 6AL5.
- ☐ V-5, 6L6GC.
- ☐ V-6, 12AX7.
- ☐ V-8, 6BQ5.
- ☐ V-9, 6CL6.
- ☐ Install the 15 amp fuse in the fuse holder nearer the inside bottom of the chassis. Note the stamping on the outside of the chassis for location.
- ☐ Install the 2 amp fuse in the remaining fuse holder.
- ☐ Large knob. Place on the shaft of the tuning capacitor. Tighten the set-screw against the flat side of the shaft.
- ☐ Place the remaining knobs over the shafts of the other controls. Tighten the set-screws against the flat side of the shafts.

NOTE: Tubes V-8 and V-9 DO NOT use tube shields. Sufficient shielding is provided by the shield bases. DO NOT install additional shields.

- ☐ Place the tube shields over the tubes: small shield over V-4, medium shields over V-2 and V-3, and the remaining large shields (for 9-pin tubes) over V-1 and V-6.

BEFORE YOU USE YOUR TRANSCEIVER, IT MUST BE ALIGNED. TURN TO THE ALIGNMENT SECTION IN YOUR OPERATOR'S MANUAL AND PERFORM THE ENTIRE ALIGNMENT PROCEDURE.

WIRING THE MICROPHONE CONNECTOR

SEE FIGURE 26.

- ☐ Disassemble the microphone connector.

Slip the following parts onto the microphone cord as shown:

- ☐ Small diameter knurled nut, large opening toward the end of the cord.
- ☐ Coil spring, with the flared end toward the end of the cord.
- ☐ Cable grip, with the teeth toward the end of the cord.
- ☐ Large knurled nut, threaded end toward the cord end.
- ☐ Connector housing, threaded end first.
- ☐ Trim the lengths of the wires as required and strip back ¾" of insulation from each wire end. Solder the wires into the plug, as follows:
  1. Red into pin 1.
  2. Black into 2.
  3. White into 3.
  4. Shield into 4.
- ☐ Position the connector body over the plug, align the holes, and fasten with the small flat-head screw, previously removed.
- ☐ Slide the cable gripper up the cord, to a point ⅜" from the threaded end of the connector body. Squeeze the teeth together until the cord is lightly held.
- ☐ Slide the large knurled nut over the connector body.
- ☐ Place the end of the cable gripper into the rear of the connector body.
- ☐ Slide the spring up to the cable gripper, and fasten the assembly with the remaining knurled nut. Tighten securely, so the cable will be tightly held.

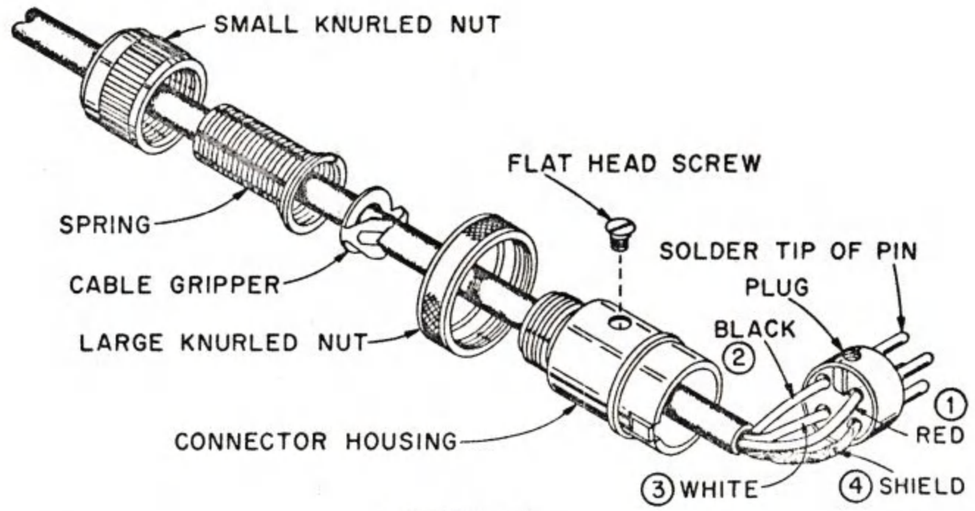


FIGURE 26

WIRING THE POWER CORDS

SEE FIGURE 27.

DC Power Cord. See Figure 27.

- ☐ Position a 12-pin plug as shown.
- ☐ ½" bare wire. Solder one end to terminal 1. Solder the other end to terminal 2.
- ☐ 1" bare wire and ½" of tubing. Solder one end of the wire to terminal 3. Slip the tubing over the wire and solder to terminal 9. **Do not let the wire touch nearby terminals.**
- ☐ ½" bare wire. Solder one end to terminal 8. Solder the other end to terminal 7.
- ☐ ½" bare wire. Solder one end to terminal 10. Solder the other end to terminal 11.
- ☐ 6 foot length of heavy red stranded wire. Twist this wire and the 6 foot length of heavy black wire together. Insert one end of these wires through the cover for the plug and through a medium grommet. Slip ½" of large tubing over each of these two ends.
- ☐ Remove ¼" of outer insulation from these wire ends. Spread out the strands and cut off 16 strands as shown in the figure. Twist the remaining strands and lightly coat them with solder.
- ☐ Solder the red wire to terminal 6. Solder the black wire to terminal 12. Slip the tubing down over the terminals.
- ☐ Check the wiring of the plug to be sure no wire or solder is touching an adjacent terminal.
- ☐ Push the cover down over the plug and insert the retaining pin through the cover into the plug base. Drive the pin all the way into the base. Position the grommet inside the adjustable clamp and tighten the screws on the clamp to hold the wire tightly.

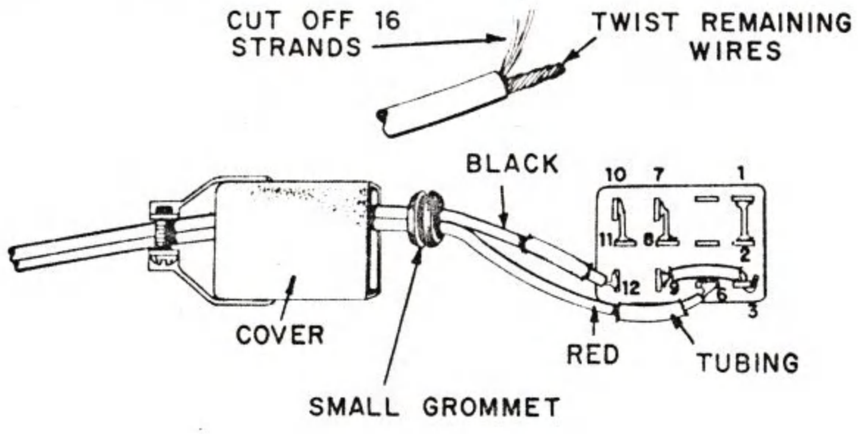


FIGURE 27

SEE FIGURE 28.

The free ends of the heavy red and black wires can be wired directly to the ignition switch (accessory terminals) if your transceiver will be permanently installed as a mobile unit. Otherwise, you may connect the accessory plug to the free ends. In either case, keep the length of these DC power cables as short as possible; excessive length will cause excessive voltage drop in the wires.

A. Remove exactly ¼" of insulation from each wire end. Crimp a small clip to the free end of each wire.

NOTE: If excessive solder is used, the clips will not fit in the plug.

B. Solder each clip where shown.

NOTE: Be sure to insert the clips correctly. Once they are inserted into the plug, they cannot be removed.

C. Push the clip soldered to the red lead into the hole marked + (positive) on the plug. Push the clip soldered to the black lead into the hole marked – (negative) on the plug.

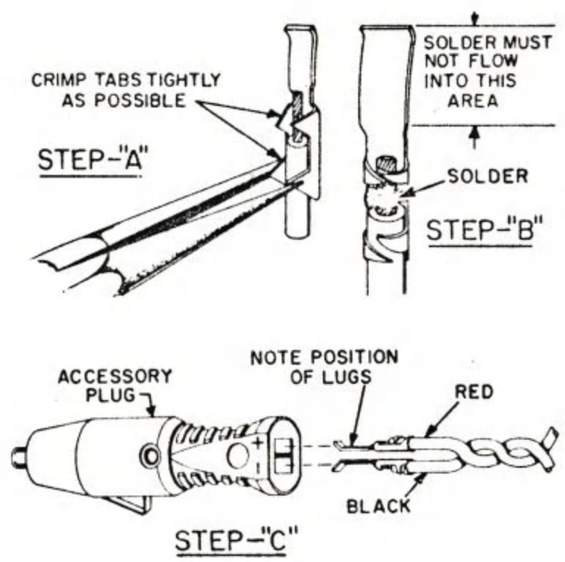


FIGURE 28

SEE FIGURE 29.

AC Power Cord. See Figure 29.

- ☐ Position the remaining 12-pin plug as shown.
- ☐ ½" bare wire. Solder one end to terminal 9. Solder the other end to terminal 5.
- ☐ Insert the ends of the line cord through the cover for the plug and through a small grommet. Slip a ½" piece of large tubing over each end.
- ☐ Solder one wire to terminal 4. Solder the other wire to terminal 6. Slip the tubing down over the terminals.
- ☐ Push the cover down over the plug and insert the retaining pin through the cover and into the plug base. Drive the pin all the way into the base. Position the grommet inside the adjustable clamp and tighten the screws on the clamp to hold the wire tightly.

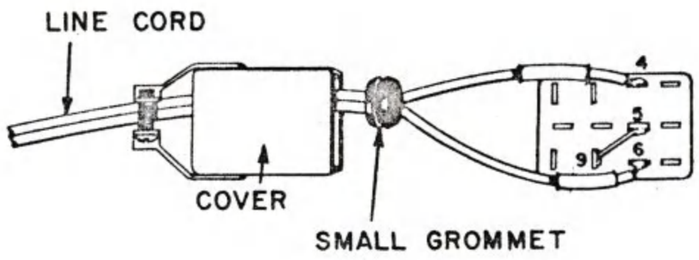


FIGURE 29

ASSEMBLING A DUMMY LOAD

SEE FIGURE 30.

Often a dummy load comes in very handy for tuning up and adjusting the transmitter. A simple dummy load can be constructed from 4 #47 bulbs.

Solder them together in a series/parallel combination as shown in the illustration below. Connect this combination to a length of coaxial cable. Terminate the other end of the cable in a connector suitable for attaching to the ANT connector on the rear of the chassis.

This load will approximate the correct impedance for the transmitter and will provide a visual method of checking the output.

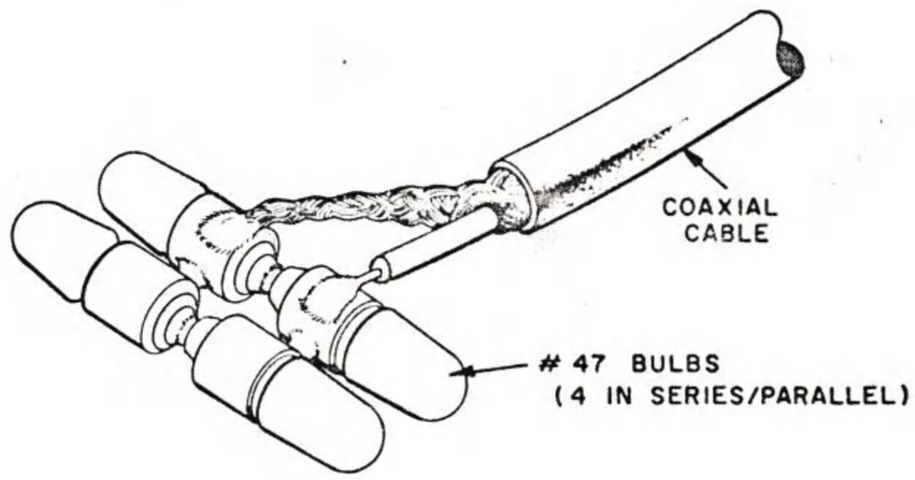


FIGURE 30

ASSEMBLING THE CABINET

SEE FIGURE 31.

- ☐ Two large clip nuts. Snap one over each hole in the front edge of the chassis (flat side of the clips away from the chassis bottom).
- ☐ Four rubber feet. Mount to the bottom half of the cabinet with four 6-32 x 5/16" screws, lockwashers and nuts.
- ☐ Fasten the cabinet bottom to the chassis with five 6-32 x 5/16" screws—two threaded up into the clip nuts at the front of the chassis and the remaining three fastened to the rear lip of the chassis with lockwashers and nuts.
- ☐ Microphone bracket. Mount on either side of the cabinet top (mount on the most convenient side). Fasten with two 6-32 x ¼" screws, lockwashers and nuts.
- ☐ Position the cabinet top down over the cabinet bottom (with the slanted hood toward the front) and fasten with four #4 self-tapping screws.

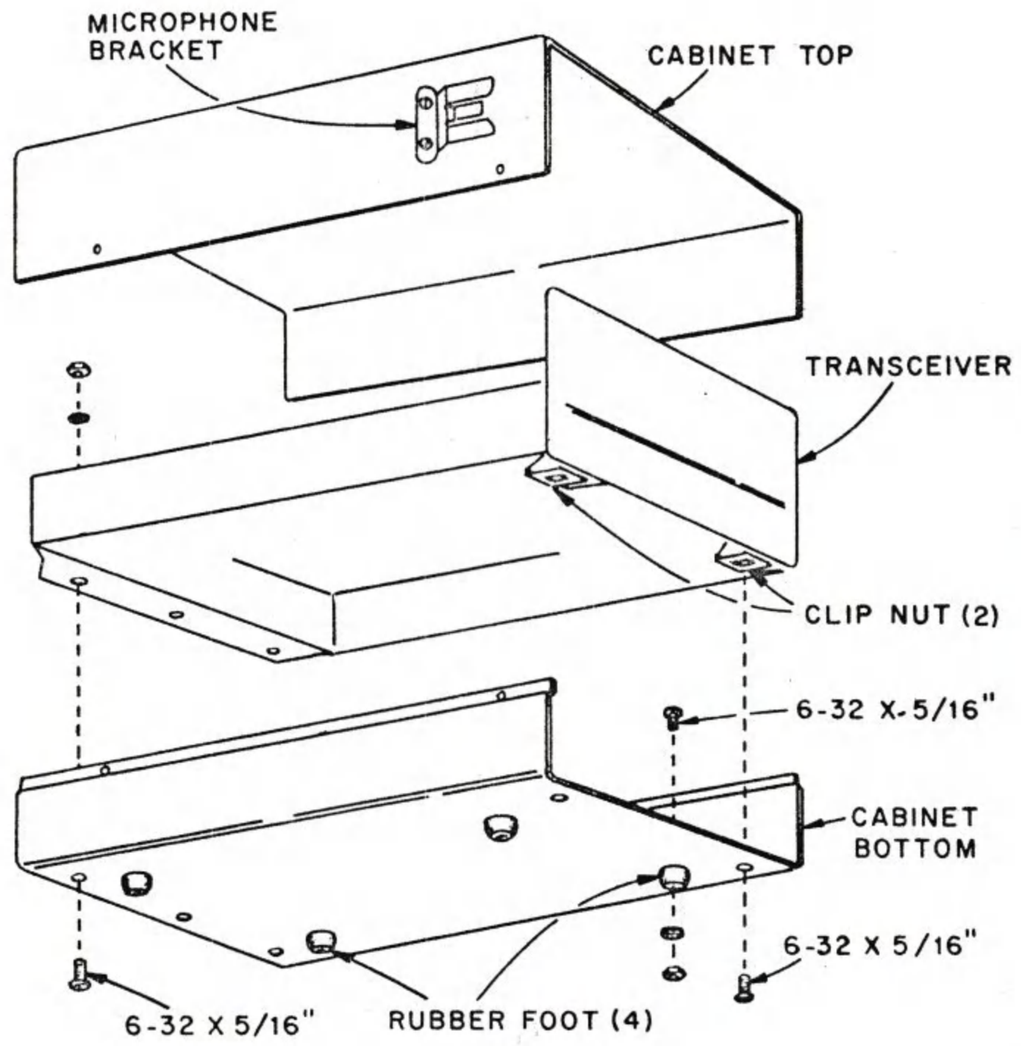


FIGURE 31

Screw, 6-32 x 3/8"	2	560-344
Screw, 6-32 x 1/4"	37	560-342
Screw, 6-32 x 5/16	10	560-343
Screw, #6 x 3/8" flat head	4	563-344
Setscrew, #8 x 7/16"	1	563-345
Screw, sheet metal #4 x 1/4"	10	562-295
Screw, sheet metal #6 x 1/2"	4	562-396
Solder lug #6	11	553-005
Solder lug 3/8"	2	553-001
Spacer, ceramic 2"	1	940-052
Spacer, ceramic, short	1	940-004
Spacer, metal 3/8"	2	485-087
Washer, flat #6	6	580-300
Washer, flat 3/8"	5	580-702

MISCELLANEOUS

Description	Quantity	Part No.
Bracket, capacitor adapter	1	463-794
Bracket, capacitor mounting	1	470-836
Bracket, microphone	1	470-672
Bracket, tuning capacitor	1	470-794
Case	1	702-113
Chassis	1	463-632
Dial	1	040-260
Holder, nut	1	958-051
Insulator, transistor	2	811-013
Knob, large	1	765-092
Knob, small	6	765-074
Meter	1	659-275
Microphone	1	734-073
Panel, back	1	470-736
Panel, front	1	990-421
Relay, 3 pdt K-1		195-057
Shield, pilot lamp	1	712-001
Shield, 7 pin, long	2	511-052
Shield, 7 pin, short	1	511-057
Shield, 9 pin	2	511-053
Speaker	1	734-076
Sub-assembly, converter	1	040-261
Tool, tuning	1	957-007
Window, dial	1	870-183

TS-7	4 terminal	440-403
TS-8	3 terminal	440-306
TS-9	5 terminal	440-501
TS-10	4 terminal	440-401
TS-11	1 terminal	440-102
TS-12	2 terminal	440-202

TRANSFORMERS, COILS, CHOKES

Symbol	Description	Part Number
L-1	Mixer	142-148
L-2	RCVR oscillator	142-149
L-3	Tank coil	152-170
L-4	Transmitter oscillator	142-126
L-5	Doubler	142-147
RFC-2	Choke, .5 μhy	152-042
RFC-1	Choke, 7 μhy	162-191
T-1	IF input	113-279
T-2	IF interstage	113-280
T-3	IF output	113-281
T-4	Power	107-308
T-5	Modulation	107-307

TUBES, LAMPS, SEMICONDUCTORS

Symbol	Description	Part Number
CR-1	Diode, germanium	630-007
CR-2	Silicon diode 800 piv	630-051
CR-3	Silicon diode 800 piv	630-051
F-1	15 amp, 3AG	491-001
F-2	2 amp, 3AG, Slo-Blo	491-004
PL-1	Lamp, #47	640-002
PL-2	Indicator, neon	642-000
TR-1	2N1541	660-098
TR-2	2N1541	660-098
V-1	6EA8	611-037
V-2	6BZ6	610-050
V-3	6BZ6	610-050
V-4	6AL5	611-005
V-5	6L6GC	614-295
V-6	12AX7	611-012
V-7	2E26	614-297
V-8	6BQ5	610-056
V-9	6CL6	610-016

S LIST

Symbol	Description		Part Number
	Socket, crystal	6	509-054
	Socket, lamp	1	509-117
	Socket, microphone, J-3	1	509-098
	Socket, octal	1	509-052
	Socket, octal	1	501-180
	Socket, power	2	509-082
	Socket, transistor	2	501-020
	Socket, 7 pin tube	3	509-056
	Socket, 9 pin tube	4	509-067
	Socket, 4 cond. J-9	1	509-080

HARDWARE

Description	Quantity	Part No.
Clip, transformer mounting	3	532-008
Clipnut #6, small	1	531-014
Clipnut #6, large	2	531-009
Eyelet	2	551-000
Foot, rubber	4	831-001
Grommet, rubber 1/4"	4	830-001
Grommet, rubber 3/8"	5	830-003
Grommet, rubber 1/2"	5	830-006
Lockwasher #4	24	582-200
Lockwasher #6	70	582-300
Lockwasher #8	4	582-400
Lockwasher 1/4"	6	582-600
Lockwasher 3/8" heavy	7	582-701
Lockwasher 3/8" thin	2	582-700
Nut #4	22	570-221
Nut #6	47	570-340
Nut #8	4	570-440
Nut 1/4"	6	579-751
Nut 3/8"	10	570-840
Nut, knurled 3/8"	2	579-754
Screw, 4-40 x 1/4"	24	560-222
Screw, 6-32 x 3/16"	3	560-341

SWITCHES

Symbol	Description	Part Number
S-1	Slide switch	437-086
S-2	Rocker switch (black)	437-150
S-3	Rocker switch (black)	437-150
S-4	Rotary switch	437-153
S-5	Rocker switch (red)	437-152

WIRE, SOLDER, TUBING

Description	Quantity	Part No.
Red 2"	4	807-022
Orange 3"	15	807-023
Yellow 4"	3	807-024
Blue 6"	3	807-026
Gray 8"	1	807-028
Red, heavy 6 ft.	1	808-023
Black, heavy 6 ft.	1	808-024
Bare wire, 5 ft.	1 pc.	800-600
Braided wire, 1/4"	3"	808-032
Harness, wiring	1	809-024
Lacing twine	1 pc.	860-022
Linecord	1	802-001
Coaxial cable, 12"	1	808-007
Shielded cable, gray 9 3/4"	2	808-026
Shielded cable, gray 13 1/2"	2	808-026
Shielded cable, gray 16"	1	808-026
Solder	20 ft.	931-020
Tubing, black 3 ft.	1 pc.	812-031
Tubing, yellow 4"	1 pc.	812-003

TERMINAL STRIPS

Symbol	Description	Part Number
TS-1	13 terminal	440-902
TS-2	4 terminal	440-407
TS-3	3 terminal	440-303
TS-4	4 terminal	440-402
TS-5	2 terminal vertical	442-956

C-29	10 μf 50 V electrolytic	202-100
C-30	390 pf	276-398
C-31	.005 μf	276-054
C-32	5 μf 15 V electrolytic	225-460
C-33	68 pf 5%	266-558
C-34	220 pf	276-228
C-35	.05 μf	275-506
C-36	470 pf	276-478
C-37	5 μf 15 V electrolytic	225-460
C-38	220 pf	276-228
C-39	Antenna loading	286-106
C-40	Final tune	286-105
C-41	750 pf 10% silver mica	226-551
C-42	.001 μf 2 KV 10%	278-016
C-43	.001 μf	276-016
C-44	.001 μf	276-016
C-45	2200 pf	276-227
C-46	2200 pf	276-227
V-47	2200 pf	276-227
C-48	.001 μf	276-016
C-49	.001 μf	276-016
C-50	.001 μf	276-016
C-51	68 pf 5%	266-558
C-52	.005 μf	276-054
C-53	Mult-tune	286-095
C-54	.005 μf	276-054
C-55	30 pf 10% silver mica	266-559
C-56	15 pf 5%	296-028
C-57	10 μf 50 V electrolytic	202-100
C-58	30 μf 250 V electrolytic	225-474
C-59	10 μf 450 V electrolytic	225-473
C-60	40, 10, 40, 30 μf 450, 250, 250 V electrolytic in can	236-460
C-61	.01 μf	276-015
C-62	.01 μf	276-015
C-63	.001 μf	276-016
C-64	.001 μf 2 KV	278-016
C-65	10 pf 5%	296-072

R-34	390 K	301-394
R-35	150 K	301-154
R-36	4.7 K	301-472
R-37	330 K	301-334
R-38	56 K 1 watt	304-563
R-39	68 Ω	301-680
R-40	100 K	301-104
R-41	15 K	301-153
R-42	68 K	301-683
R-43	39 K	301-393
R-44	47 K	301-473
R-45	220 Ω 1 watt	304-220
R-46	220 Ω 1 watt	304-221
R-47	250 Ω 7 watt	373-005
R-48	1 K 7 watt	373-003
R-49	1 K 7 watt	373-003
R-50	250 Ω 7 watt	373-005
R-51	15 K 1 watt	304-153
R-52	47 Ω	301-470
R-53	68 Ω 1 watt	304-680
R-54	39 K	301-393
R-55	68 Ω	301-680
R-56	27 K	301-273
R-57	56 Ω 1 watt	304-560
R-58	68 Ω 1 watt	304-680
R-59	56 K ¼ watt	309-563
R-60	56 K ¼ watt	309-563

CONNECTORS

Description	Quantity	Part No.
Clip, plate	1	501-193
Connector, coaxial, J-1	1	502-222
Connector, front panel ground	1	470-839
Fuseholder	2	492-101
Jack, phone, J-2	1	502-241
Plug, microphone	1	509-099
Plug, pin	1	502-220
Plug, power, J-8	1	509-081
Plug, 12 V autoadapter	1	880-021

knight-kit®

PARTS

CAPACITORS

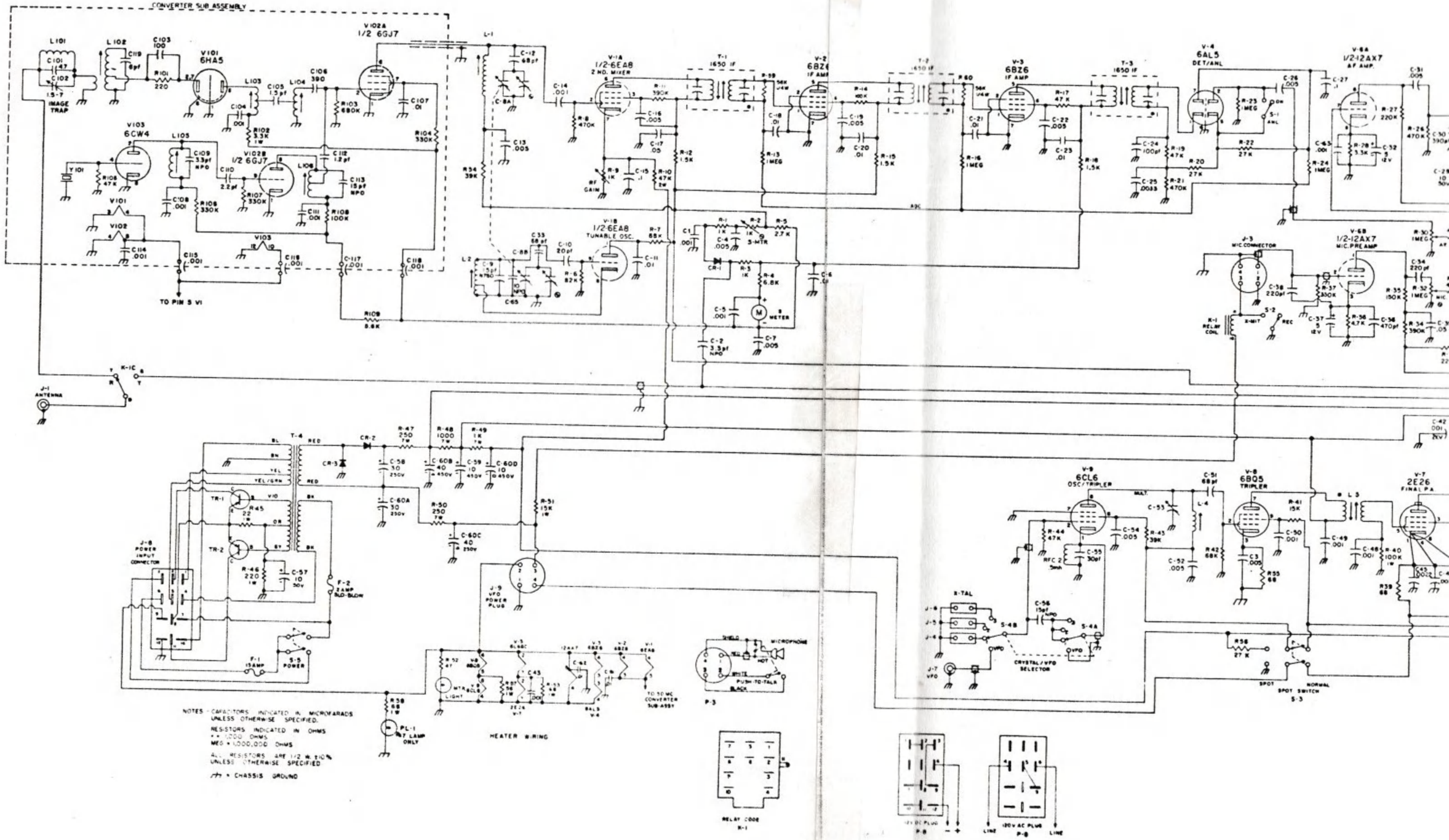
NOTE: Capacitors are disc ceramic, 20% tolerance unless otherwise specified. Capacitors may be supplied with voltage ratings higher than specified.

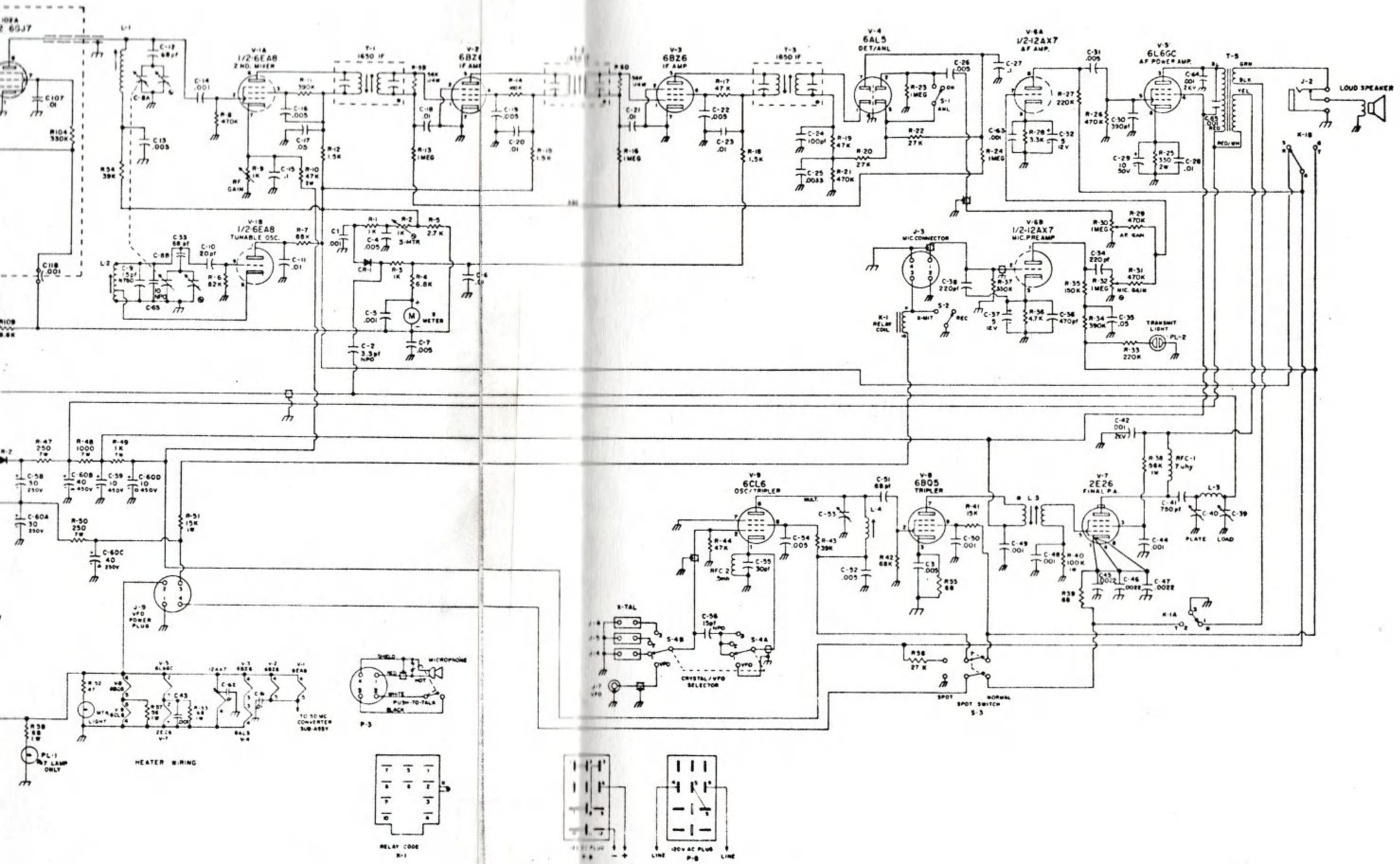
Symbol	Description	Part Number
C-1	.001 μf	276-016
C-2	33 pf 10%	278-069
C-3	.005 μf	276-054
C-4	.005 μf	276-054
C-5	.001 μf	276-016
C-6	.01 μf	276-015
C-7	.005 μf	276-054
C-8	RCVR tuning	286-104
C-9	15 pf	296-061
C-10	20 pf 10%	296-014
C-11	.01 μf	276-015
C-12	68 pf 5%	266-558
C-13	.005 μf	276-054
C-14	.001 μf	276-016
C-15	.1 μf	272-014
C-16	.005 μf	276-054
C-17	.05 μf	275-506
C-18	.01 μf	276-015
C-19	.005 μf	276-054
C-20	.01 μf	276-015
C-21	.01 μf	276-015
C-22	.005 μf	276-054
C-23	.01 μf	276-015
C-24	100 pf	297-014
C-25	3300 pf 10%	276-337
C-26	.005 μf	276-054

RESISTORS

NOTE: Resistors are ½ watt carbon composition, 10% tolerance, unless otherwise specified.

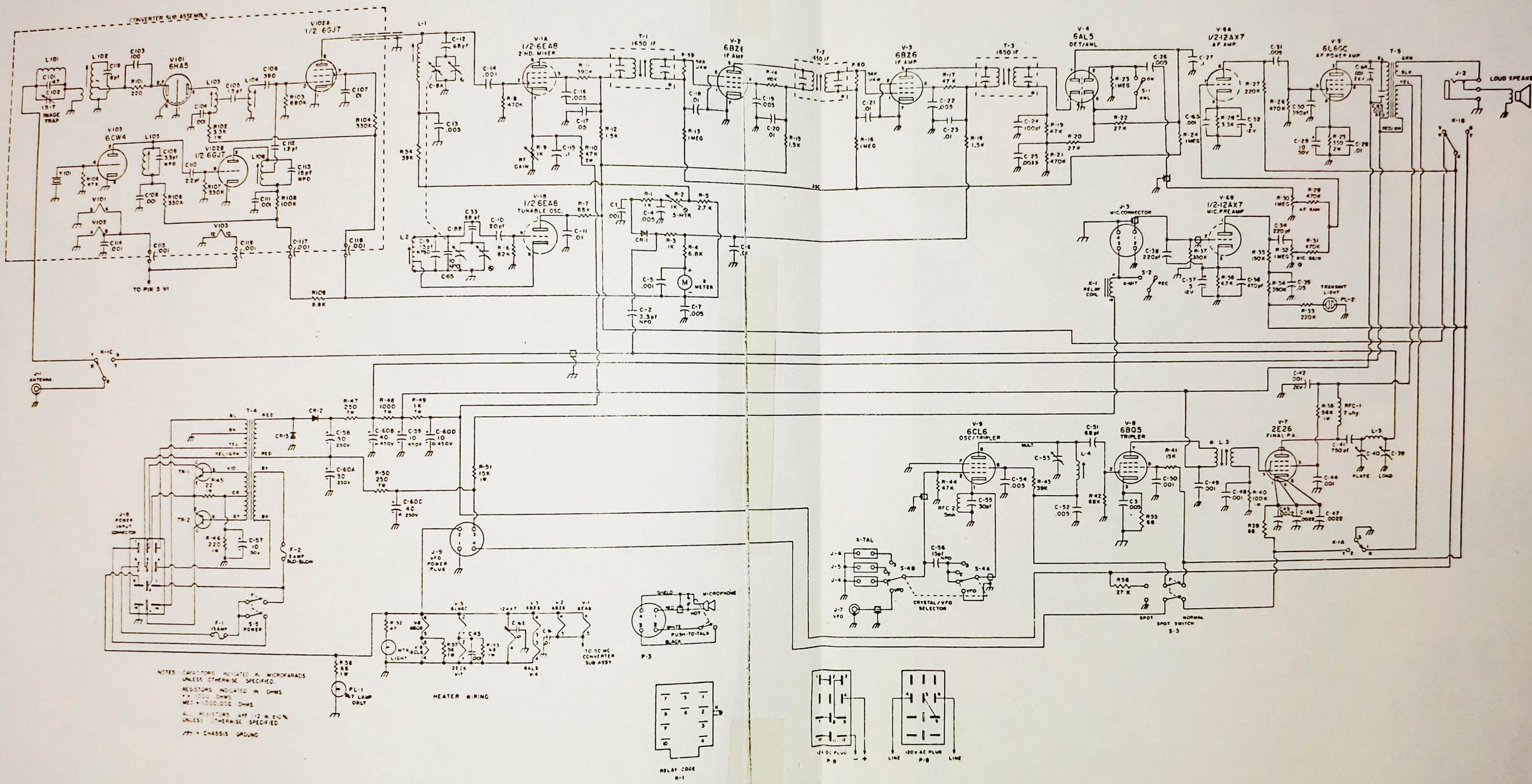
Symbol	Description	Part Number
R-1	1 K	301-102
R-2	1 K control	392-234
R-3	1 K	301-102
R-4	6.8 K	301-682
R-5	2.7 K	301-272
R-6	82 K	301-823
R-7	68 K	301-683
R-8	470 K	301-474
R-9	1 K control	392-232
R-10	47 K 2 watt	307-473
R-11	390 K	301-394
R-12	1.5 K	301-152
R-13	1 meg	301-105
R-14	100 K	301-104
R-15	1.5 K	301-152
R-16	1 meg	301-105
R-17	47 K	301-473
R-18	1.5 K	301-152
R-19	47 K	301-473
R-20	27 K	301-273
R-21	470 K	301-474
R-22	27 K	301-273
R-23	1 meg	301-105
R-24	1 meg	301-105
R-25	330 Ω 2 watt	307-331
R-26	470 K	301-474
R-27	220 K	301-224
R-28	3.3 K	301-332
R-29	470 K	301-474
R-30	1 meg control	392-233


CONVERTER SUB ASSEMBLY
V102A 1/2 6GJ7
L101
L102
C103 100
C119 8pf
V101 6HA5
R101 220
L103
C105 1.5 pf
L104
C106 390
C104 .001
R102 3.3K 1w
R103 680K
C107 .01
R104 330K
IMAGE TRAP
1.5-7
V103 6CW4
L105
C109 33pf NPO
Y101
R106 47K
V102B 1/2 6GJ7
C110 2.2pf
R107 330K
L106
C112 1.2 pf
C113 15pf NPO
C111 .001
R108 100K
R108 330K
C108 .001
V101
V102
V103
C114 .001
C115 .001
C116 .001
C117 .001
C118 .001
TO PIN 5 V1
R109 0.8K
L-1
C-12 68pf
C-8A
C13 .005
R34 39K
C-14 .001
V-1A 1/2-6EA8 2 ND. MIXER
R-11 390K
R-8 470K
C-16 .005
C-17 .05
R-12 1.5K
R-9 1K RF GAIN
C-15 .1
R-10 47K 2w
T-1 1650 IF
R-59 56K 1/4W
C-18 .01
R-13 1MEG
V-2 6BZ6 IF AMP
R-14 100K
C-19 .005
C-20 .01
R-15 1.5K
T-2 1650 IF
R-60 56K 1/4W
C-21 .01
R-16 1MEG
V-3 6BZ6 IF AMP
R-17 47 K
C-22 .005
C-23 .01
R-18 1.5K
T-3 1650 IF
C-24 100pf
R-19 47K
C-25 .0033
R-21 470K
V-4 6AL5 DET/ANL
C-26 .005
R-23 1MEG
S-1 ANL
R-22 27K
R-20 27K
V-6A 1/2-12AX7 AF AMP.
C-27
C-31 .005
R-27 220K
R-26 470K
C-30 390pf
C-29 10 50V
C-28 .005
R-28 3.3K
C-32 5 12V
R-24 1MEG
AVC
V-1B 1/2-6EA8 TUNABLE OSC.
C-33 68 pf
C-10 20pf
R-7 88K
C-11 .01
R-6 82K
C-88
C-9 5pf +750
C-65
L-2
C1 .001
R-1 1K
R-2 1K
R-5 2.7 K
S-MTR
C-4 .005
CR-1
R-3 1K
R-4 6.8K
C-5 .001
M METER
C-2 3.3pf NPO
C-7 .005
C-6 .01
J-3 MIC CONNECTOR
V-6B 1/2-12AX7 MIC. PRE AMP
R-30 1MEG
C-34 220 pf
C-38 220pf
R-37 330K
R-35 150K
R-32 1MEG
MIC
C-37 5 12V
R-36 4.7K
C-36 470pf
R-34 390K
C-35 .05
S-2
R-MIT
REC
R-1 RELAY COIL
J-1 ANTENNA
K-1C
T-4
BL
BN
YEL
YEL/GRN
RED
CR-2
CR-3
R-47 250 7w
R-48 1000 7w
R-49 1K 1w
C-60B 40 + 450V
C-59 10 450V
C-60D 10 + 450V
C-58 30 250V
C-60A 30 250V
R-50 250 7w
C-60C 40 + 250V
R-51 15K 1W
TR-1
TR-2
R-45 22 1w
R-46 220 1w
C-57 10 50V
J-8 POWER INPUT CONNECTOR
F-2 2 AMP SLO-BLOW
F-1 15 AMP
S-5 POWER
J-9 VFO POWER PLUG
R-52 47
V-5 6L6GC
V-3 6BZ6
12AU7
V-2 6BZ6
V-1 6EA8
R-53 56 1W
R-33 4.8 1W
C-42
C-43
C-44
MTR
SCALE
LIGHT
DIAL
2E26 V-7
6AL5 V-4
TO 50 MC CONVERTER SUB-ASSY
R38 68 1 W
PL-1 #47 LAMP ONLY
HEATER WIRING
SHIELD
MICROPHONE
HOT
WHITE
PUSH-TO-TALK
BLACK
P-3
RELAY CODE
R-1
V-9 6CL6 OSC/TRIPLER
MULT.
C-53
C-51 68 pf
L-4
R-44 47K
C-54 .005
R-43 39K
RFC 2 5mh
C-55 30pf
C-52 .005
V-8 6BQ5 TRIPLER
R-41 15K
R-42 68K
C-50 .001
C3 .005
R35 68
L-3
V-7 2E26 FINAL P.A.
C-49 .001
C-48 .001
R-40 100K 1w
C-45 .002
R39 68
X-TAL
J-6
J-5
J-4
S-4B
S-4A
C-56 15pf NPO
VFO
J-7 VFO
CRYSTAL / VFO SELECTOR
R36 27 K
SPOT
NORMAL
SPOT SWITCH
S-3
12V DC PLUG
P-8
120v AC PLUG
P-8
LINE
NOTES - CAPACITORS INDICATED IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
RESISTORS INDICATED IN OHMS
K = 1,000 OHMS
MEG = 1,000,000 OHMS
ALL RESISTORS ARE 1/2 W. ±10% UNLESS OTHERWISE SPECIFIED
= CHASSIS GROUND


V-1A 1/2 6EA8 2ND. MIXER
V-1B 1/2 6EA8 TUNABLE OSC.
V-2 6BZ6 IF AMP
V-3 6BZ6 IF AMP
V-4 6AL5 DET/ANL
V-5 6L6GC AF POWER AMP.
V-6A 1/2-12AX7 AF AMP.
V-6B 1/2-12AX7 MIC. PREAMP
V-7 2E26 FINAL P.A.
V-8 6B05 TRIPLER
V-9 6CL6 OSC/TRIPLER
T-1 1650 IF
T-2 1650 IF
T-3 1650 IF
T-5
J-1 MIC CONNECTOR
J-2 LOUD SPEAKER
J-3 MIC CONNECTOR
J-7 VFO
J-9 VFO POWER PLUG
K-1 RELAY COIL
K-1A
K-1B
S-1 ANL
S-2 K-MIT REC
S-3 SPOT NORMAL SPOT SWITCH
S-4A S-4B CRYSTAL/VFO SELECTOR
X-TAL
VFO
AF GAIN
MIC GAIN
RF GAIN
S-METER
TRANSMIT LIGHT PL-2
PLATE LOAD
RFC-1 7 uhy
RFC 2 3mh
L-1 L-2 L-3 L-4 L-5
C-1 C-2 C-3 C-4 C-5 C-6 C-7 C-8A C-8B C-9 C-10 C-11 C-12 C-13 C-14 C-15 C-16 C-17 C-18 C-19 C-20 C-21 C-22 C-23 C-24 C-25 C-26 C-27 C-28 C-29 C-30 C-31 C-32 C-33 C-34 C-35 C-36 C-37 C-38 C-39 C-40 C-41 C-42 C-43 C-44 C-45 C-46 C-47 C-48 C-49 C-50 C-51 C-52 C-53 C-54 C-55 C-56 C-57 C-58 C-60A C-60B C-60C C-60D C-63 C-64 C-65
R-1 R-2 R-3 R-4 R-5 R-6 R-7 R-8 R-9 R-10 R-11 R-12 R-13 R-14 R-15 R-16 R-17 R-18 R-19 R-20 R-21 R-22 R-23 R-24 R-25 R-26 R-27 R-28 R-29 R-30 R-31 R-32 R-33 R-34 R-35 R-36 R-37 R-38 R-39 R-40 R-41 R-42 R-43 R-44 R-45 R-47 R-48 R-49 R-50 R-51 R-52 R-53
CR-1
PL-1 PILOT LAMP ONLY
HEATER WIRING
TO 50 MC CONVERTER SUB-ASSY
MICROPHONE
PUSH-TO-TALK
SHIELD
HOT
WHITE
BLACK
RELAY CODE K-1
120v AC PLUG P-8
LINE
P-3

2615 W. 7th
Ft. Worth, Texas 76107

DIAGRAM



NOTES: CAPACITORS INDICATED IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
RESISTORS INDICATED IN OHMS
K = 1000 OHMS
MEG = 1000,000 OHMS
ALL RESISTORS ARE 1/2 W ±10% UNLESS OTHERWISE SPECIFIED
⏚ = CHASSIS GROUND